

July 1998

Task 2: Rate Comparisons

Final Report

Prepared for

**Legislative Study Commission on the
Future of Electric Service in North Carolina**

300 N. Salisbury Street
Suite 545
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Prepared by

Research Triangle Institute
Center for Economics Research
Research Triangle Park, NC 27709

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1

Introduction

This report presents retail electricity rate comparisons between North Carolina and the U.S., and between North Carolina and neighboring states in the southeast. It also presents retail electricity rate comparisons within North Carolina. The comparisons are presented for organizations that provide electric service (i.e., provider groups) to various types of customers (i.e., customer classes). The report concludes with a discussion of retail electric rates and industrial development success in North Carolina.

The material in this report was developed pursuant to Task Order Authorization #2 between Research Triangle Institute (RTI) and the Study Commission on the Future of Electric Service in North Carolina. The Commission is investigating the basic question of whether retail competition in the electricity industry should be introduced in North Carolina and several ancillary questions related to that basic question.

North Carolina is currently served by several providers of electricity. These providers are traditionally grouped into three provider groups:

- Z Investor-owned utilities (IOUs)
- Z Municipal electric utilities (munis, or publicly owned utilities, POUs)
- Z Rural electric cooperatives (co-ops, or customer-owned utilities, COUs).

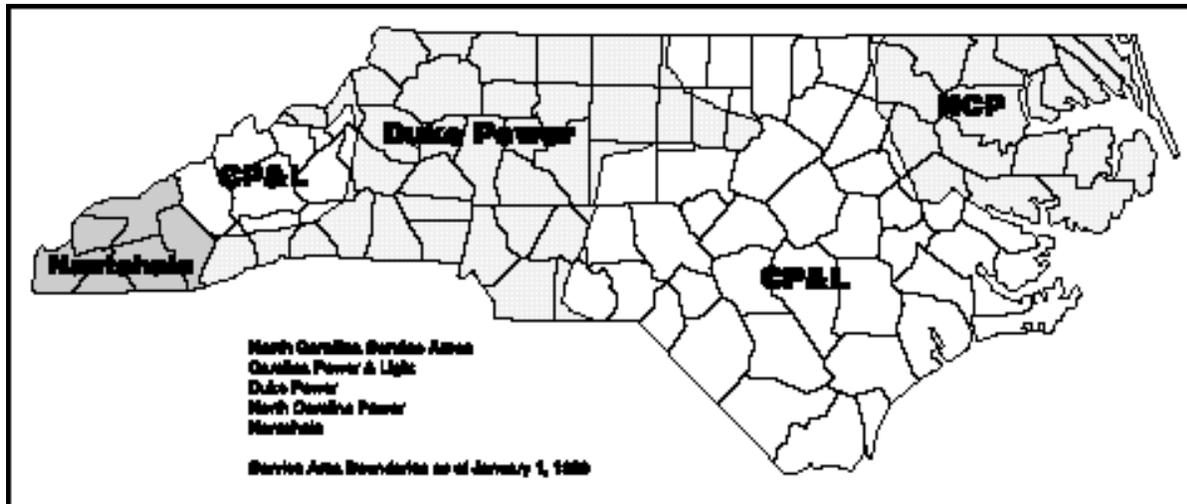
The major (Class A) IOUs in North Carolina are:

- Z Carolina Power & Light (CP&L)

- Z Duke Power
- Z Nantahala Power and Light (a wholly owned subsidiary of Duke Power)
- Z North Carolina Power (operated in North Carolina by Virginia Electric and Power Company).

Their service areas are illustrated in Figure 1-1.

Figure 1-1. Service Areas for North Carolina Investor-Owned Utilities



Munis in North Carolina are members of Electricities, a municipal trade and service organization that provided the data on municipally-provided electricity rates presented in this report. Of the 71 munis that are Electricities members, 51 have invested in electricity generation through two municipal power agencies:

- Z North Carolina Municipal Power Agency #1 (NCMPA1), which consists of 19 munis in the western Piedmont of North Carolina
- Z North Carolina Eastern Municipal Power Agency (NCEMPA), which consists of 32 munis in eastern North Carolina.

The additional 20 Electricities members are dispersed throughout the state and are not members of these agencies. These nonmembers have not invested in electricity generation through the two municipal power agencies; however, several of these utilities own generating facilities, and many of the nonmembers in eastern North Carolina purchase electricity from NCEMPA members either

directly or indirectly. A complete list of municipal utilities is presented in Appendix A.

There are 28 co-ops located in North Carolina. Another four co-ops headquartered outside the state have multistate service territories that include North Carolina. Of the 28 in North Carolina, all but French Broad are members of the North Carolina Electric Membership Corporation (NCEMC) and have invested in electricity generation. A list of all co-ops serving North Carolina is presented in Appendix B.

2

Retail Electric Rates: Background

Before examining and comparing retail electric rates, one must have a basic understanding of how utilities establish rates and how average rates are calculated and compared in this report.

2.1 HOW RATES ARE ESTABLISHED

An individual customer's electric bill is calculated according to a rate schedule. Rate schedules vary across and within customer groups. The variations traditionally have reflected the costs of serving the particular group. Multiple rate schedules may be offered to a single group, and a single rate schedule may be offered to multiple groups.

Traditional cost-of-service rate-making is based on a utility's estimated revenue requirement for a particular test year (North Carolina uses a historical test year for rate-making). This revenue requirement for an IOU is based on historical test year expenses, with some adjustments, plus an allowed return on its rate base. The allowed return on rate base is the product of the rate of return allowed by the regulatory agency multiplied by the rate base. The rate of return reflects a utility's cost of capital (debt and equity). The rate base consists of the value of a utility's assets (usually valued at book value) that are allowed by the regulatory agency.

Under this traditional form of rate-making, the revenue requirement is allocated among customer classes (e.g., residential, small general service, large general service). Costs are typically separated into four types to facilitate this allocation:

- Z Customer costs
- Z Variable production costs
- Z Fixed production costs
- Z Other fixed costs (transmission and distribution).

Customer costs vary with the costs of providing electric service to a customer location and with the concentration of customers. These costs increase when customers are costly to serve. Customers are costly to serve in remote areas, in areas with hilly terrain, and when they require special meters. Average customer costs are reflected in a fixed monthly charge called the customer charge component of a rate schedule.

Variable production costs change with the direct cost of producing a kilowatt-hour (kWh) and with kWh consumption levels. These costs increase when direct production costs per kWh increase and when consumption levels increase, and they are primarily related to fuel costs. As long as a utility is not near its generation or energy delivery limits, total variable production costs typically increase at a slower rate than increases in kWh consumption.

Fixed production costs, typically the costs of providing generation capacity to all customers, do not vary with customers or energy production. Traditionally, these costs are allocated on the basis of a customer group's contribution to the highest hour or hours of consumption (peak demand) for the utility system.

Other fixed costs, primarily the costs of transmission and distribution services, generally do not vary with a customer's energy consumption, and they are typically allocated on the basis of peak demand characteristics.

Because electricity cannot be stored easily in large quantities and at low cost, it has to be generated and delivered on demand. Thus, system capacity has to be built to serve peak demand, plus a reserve margin to cover contingencies. Since peak demand drives capacity requirements, fixed (capacity) costs are typically allocated to customer groups on a "peak-responsibility" basis (i.e., the portion of the utility's peak demand that is contributed by a customer group). These fixed costs are calculated as the product of kW demand multiplied by an associated charge; they are known as the demand charge (\$/kW) component of a rate schedule.

Smaller customers (e.g., residential and some small commercial customers) may not have a demand charge in their rate schedules. In these cases, the demand charge is typically rolled in with the usage (kWh) charge; thus, their ¢/kWh charges may be higher than the ¢/kWh charges for larger customers.

The electric utility industry is capital intensive, with large fixed costs relative to operating costs. For any capital-intensive industry, the greater the percentage of capacity utilized, that is the more that plants are actually in use, the lower the average costs. This is the result of spreading the fixed costs over larger production levels. Customers that help utilities achieve this result through large kWh consumption levels (e.g., large industrial customers) are frequently offered rate schedules that reflect these contributions to average cost reductions. This is the rationale for so-called declining block rate schedules. Under these schedules, customers essentially receive quantity discounts—for example, the charge for the last block of kWh consumption (e.g., over 1,000,000 kWh per month) may be lower than the charge for the initial block(s) of kWh consumption.

Rate schedules may also reflect other cost characteristics. For example, off-peak periods are cheaper for a utility to serve than peak periods, so time-differentiated rates (on a seasonal, weekday/weekend, or time-of-day basis) are available in many locations. When offered, these rates typically are made available to larger customers in a customer class where the higher usage justifies higher metering costs. Time-of-use (TOU) and real-time prices (RTP) are examples of these rates.

2.2 WHAT IS MEANT BY “AVERAGE RATES”?

Although an individual customer’s electric bill is calculated according to a rate schedule (as discussed in the previous section), the data presented throughout this report are for average electric rates for all customers within a customer class. These averages (in ¢/kWh) were calculated by dividing the electricity bills for all customers in the class by the amount of electricity consumed by all customers in the class. For example, an average rate for Duke Power residential customers is the sum of bills across all these customers divided by the sum of their total kWh usage. The

average rates cited in this report, therefore, are aggregated for all customers in a customer class.

Aggregation has two major advantages:

- Z There is less of a confidentiality issue, so aggregated data can be released more readily.
- Z Less data processing is needed when analyzing aggregated data.

Aggregation, however, also has two major disadvantages:

- Z It may mask interesting differences that are obvious in more detailed data.
- Z Aggregated data reflect a blend of influences rather than individual influences.

Average rates can be influenced by one or more of the following factors, unless the data are adjusted to remove the influence of these factors:

- Z Usage
- Z Rate schedules
- Z Rate levels within similar rate schedules
- Z Customer demographics
- Z Housing or building characteristics
- Z Appliance and energy end-use characteristics
- Z Weather.

2.3 COMPARING AVERAGES

Average electric rates discussed in this report are not rates that individual retail customers see; rather, they are averages that reflect a mix of several influences. Average rates for a provider group or customer class will reflect differences in rates seen by individual customers and in their electricity consumption levels. For example, average rates will tend to be lower for provider groups that have a large share of large customers (e.g., IOUs).

Average rates will also reflect differences in the provider's cost of serving a customer class. For example, rates will tend to be higher for providers such as co-ops with a low density of customers (i.e., few customers per mile of distribution line) in their service territories. Rates will also tend to be higher for providers with service territories that include mountains or other difficult terrain.

The type, vintage, and efficiency of generation for providers that own generation resources will affect average rates. Co-ops and munis rely on a mix of purchased power and power from their ownership shares in generation. This mix varies widely in North Carolina. For example NCMPA#1 cities receive power year-round from their ownership interest in Catawba Nuclear Station, and for 8 months of the year they do not purchase power. Some munis that are not members of either municipal power agency and that do not have their own generation rely totally on purchased power. The average rate co-ops and munis charge their retail customers will reflect the price at which they purchase power through wholesale (i.e., bulk power) purchase contracts, costs associated with any generation they own, and the cost of distribution facilities necessary to serve these customers.

Because the customer base for munis and co-ops is primarily residential, the average rate for their commercial and industrial customers is based on small numbers of customers. As a result, average rates for their commercial and industrial customers can be impacted by small gains or losses in customers, whereas the average rates for their residential customer class are more stable.

2.4 SUMMARY

Rate schedules are varied and complex. Rate schedules designed to recover costs have been based on cost-allocation techniques that have been subject to regulatory scrutiny. Differences in costs, cost-allocation techniques, rate schedules, customer mix, and kWh consumption patterns can affect average rates among customer groups, requiring that comparisons be made with caution.

3

Comparisons of Average Retail Electric Rates

Comparisons of average retail electric rates are divided into three sections: NC/U.S., interstate (within the southeastern states), and intrastate (within North Carolina). The average rate comparisons are for three electricity provider groups: IOUs, municipal electric utilities, and rural electric cooperatives. They are also for three customer classes: residential, commercial, and industrial. All comparisons are from published, publicly available data sources for 1996.

As discussed in Section 2, we advise caution in comparing these average retail electric rates. Averages can be affected by a host of differences that are discussed in Section 2, but the averages reported here are unadjusted for any such differences.

3.1 AVERAGE RATES ACROSS THE U.S.

This section compares electric rates by provider group and by customer class for North Carolina relative to the U.S. The U.S. average includes all 50 states and the District of Columbia. The highest and lowest rate states are noted. The source of these data is the U.S. Department of Energy's Energy Information Administration Report DOE/EIA-0540(96) and associated databases.

The following key comparisons apply to all provider groups and customer classes (as presented in the fourth column of Tables 3-1 and 3-2):

Table 3-1. National Comparison of 1996 Rates (in ¢/kWh) by Provider Group

	IOUs	Munis	Co-ops	All Providers
Highest rate	12.12 Hawaii	10.91 Rhode Island	12.61 New Hampshire	12.12 Hawaii
North Carolina rate	6.04 31st highest	7.90 8th highest	8.62 12th highest	6.53 21st highest
Lowest rate	3.82 Idaho	3.00 Nevada	4.69 Nevada	3.96 Idaho
U.S. average	7.12	6.01	6.74	6.86

Source: U.S. Department of Energy DOE/EIA-0540(96).

Table 3-2. National Comparison of 1996 Rates (in ¢/kWh) by Customer Class

	Residential	Commercial	Industrial	All Customers
Highest rate	14.26 Hawaii	12.99 Hawaii	10.03 Hawaii	12.12 Hawaii
North Carolina rate	8.05 21st highest rate	6.39 33rd highest rate	4.79 18th highest rate	6.53 21st highest rate
Lowest rate	5.03 Washington	4.26 Idaho	2.68 Idaho	3.96 Idaho
U.S. average	8.36	7.64	4.60	6.86

Source: U.S. Department of Energy DOE/EIA-0540(96).

- Z The overall average rate for electric service in North Carolina is 6.53¢/kWh, about 5 percent below the national average of 6.86¢/kWh.
- Z There are 20 states with an average rate that is higher than North Carolina's rate.
- Z There are 30 states with an average rate that is lower than North Carolina's rate.

These results are the product of divergent influences: IOU average retail rates that are below the national IOU average and muni and co-op average retail rates that are above the national muni and co-op averages. A complete, state-by-state comparison of electric rates by provider group and by customer class is presented in Appendix C.

3.1.1 Comparisons by Provider Group

This section provides information on average retail rates for all customer classes combined. The information presented below also appears in Table 3-1.

IOUs

- Z The average rate for electric service provided by IOUs in North Carolina for all customer classes is 6.04¢/kWh, about 15 percent below the national average of 7.12¢/kWh.
- Z There are 30 states with an average rate for IOU-provided service that is higher than North Carolina's rate.
- Z There are 19 states with an average rate for IOU-provided service that is lower than North Carolina's rate.
- Z One state (Nebraska) did not report rates for IOUs.

Munis

- Z The average rate for electric service provided by munis in North Carolina for all customer classes is 7.90¢/kWh, about 31 percent above the national average of 6.01¢/kWh.
- Z There are 7 states with an average rate for muni-provided service that is higher than North Carolina's rate.
- Z There are 41 states with an average rate for muni-provided service that is lower than North Carolina's rate.
- Z Two states (District of Columbia and Hawaii) did not report rates for munis.

Co-ops

- Z The average rate for electric service provided by co-ops in North Carolina for all customer classes is 8.62¢/kWh, about 28 percent above the national average of 6.74¢/kWh.
- Z There are 11 states with an average rate for co-op service that is higher than North Carolina's rate.
- Z There are 34 states with an average rate for co-op service that is lower than North Carolina's rate.
- Z Five states (Connecticut, District of Columbia, Hawaii, Massachusetts, and Rhode Island) did not report rates for co-ops.

3.1.2 Comparisons by Customer Class

This section provides information on average retail rates for all provider groups combined. The information presented below also appears in Table 3-2.

Residential

- Z The average rate for residential electric service in North Carolina for all provider groups combined is 8.05¢/kWh, about 4 percent below the national average of 8.36¢/kWh.
- Z There are 20 states with an average rate for residential electric service that is higher than North Carolina's rate.
- Z There are 30 states with an average rate for residential electric service that is lower than North Carolina's rate.

Commercial

- Z The average rate for commercial electric service in North Carolina for all provider groups combined is 6.39¢/kWh, about 16 percent below the national average of 7.64¢/kWh.
- Z There are 32 states with an average rate for commercial electric service that is higher than North Carolina's rate.
- Z There are 18 states with an average rate for commercial electric service that is lower than North Carolina's rate.

Industrial

- Z The average rate for industrial electric service in North Carolina for all provider groups combined is 4.79¢/kWh, about 4 percent above the national average of 4.60¢/kWh.
- Z There are 17 states with an average rate for industrial electric service that is higher than North Carolina's rate.
- Z There are 33 states with an average rate for industrial electric service that is lower than North Carolina's rate.

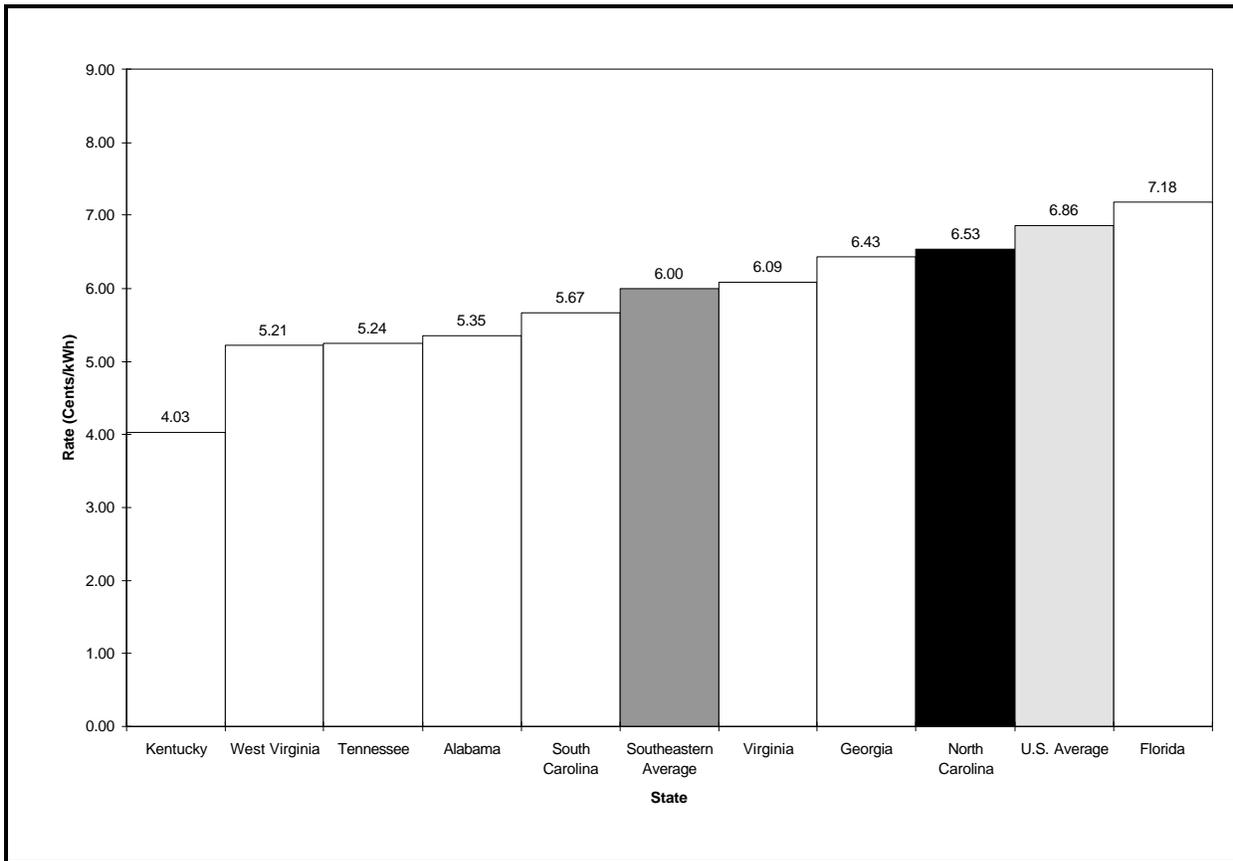
3.2 INTERSTATE AVERAGE RATE COMPARISONS

Summary comparisons of 1996 average electric rates by provider group and customer class within the southeastern U.S. are presented below. Nine southeastern states are included: North Carolina, Alabama, Florida, Georgia, Kentucky, South Carolina, Tennessee, Virginia, and West Virginia. Average U.S. electric rates in each provider group and customer class are included as reference points. The source of these data is the U.S. Department of Energy's Energy Information Administration Report DOE/EIA-0540(96) and associated databases.

The following key comparisons apply to all provider groups and customer classes (Figure 3-1):

- Z The overall average rate for electric service in North Carolina is 6.53¢/kWh, about 5 percent below the national average of 6.86¢/kWh.
- Z The overall average rate for electric service in the southeast is 6.00¢/kWh. Among the nine southeastern states, North Carolina has the second highest average electric rate, about 9 percent above the southeastern average.

Figure 3-1. Interstate Comparison of 1996 Rates: All Provider Groups and Customer Classes



3.2.1 Comparisons by Provider Group

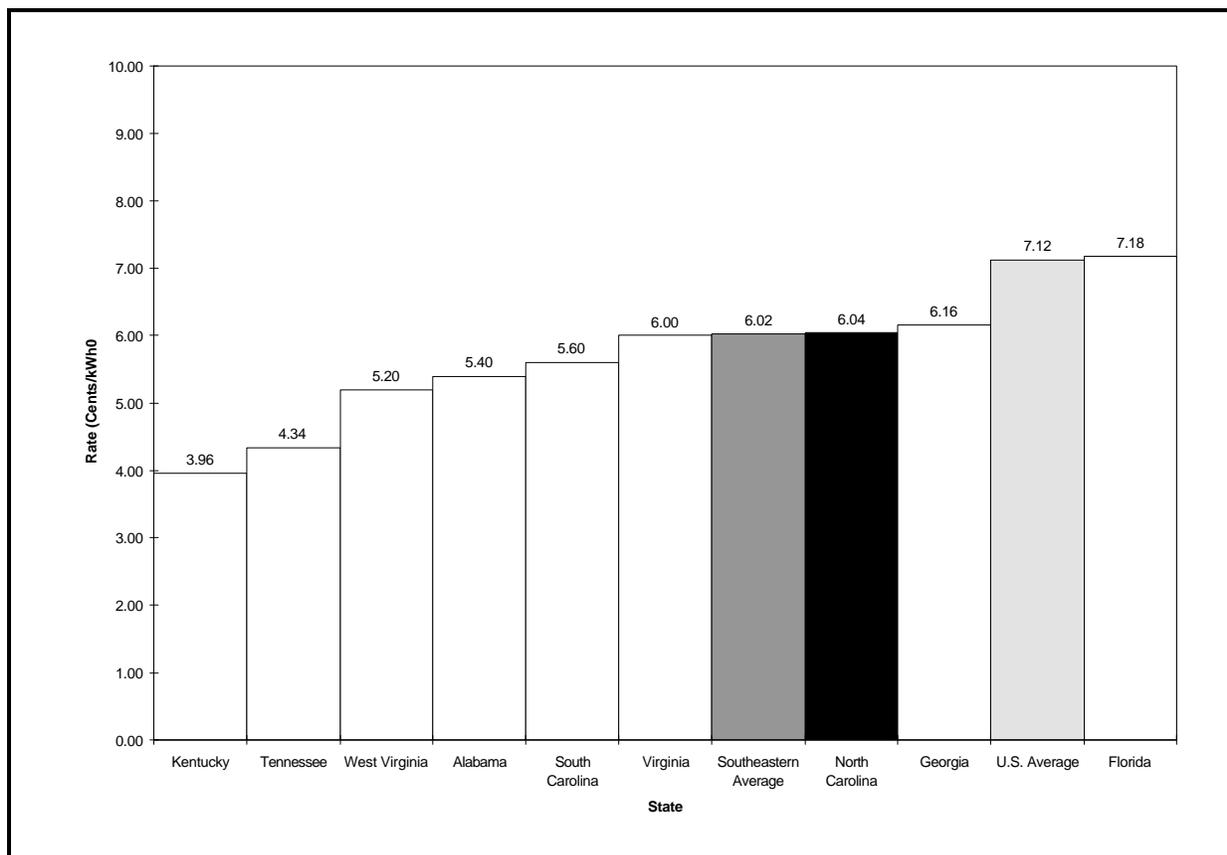
This section provides information on average retail rates for all customer classes, which includes residential, commercial, industrial, and other customers (Figures 3-2 through 3-4).

Customers in the “other” category are typically very small in number and are not separated out in the U.S. DOE data.

IOUs

- Z The average electric rate for IOU-provided electric service in North Carolina for all customer classes combined is 6.04¢/kWh, about 15 percent below the national average of 7.12¢/kWh.
- Z The average rate for IOU-provided electric service in the southeast is 6.02¢/kWh, essentially the same as the average rate for North Carolina IOUs. Among the nine southeastern states, North Carolina ranks third highest in terms of average IOU electric rate for all customer classes combined, only slightly above the southeastern average.

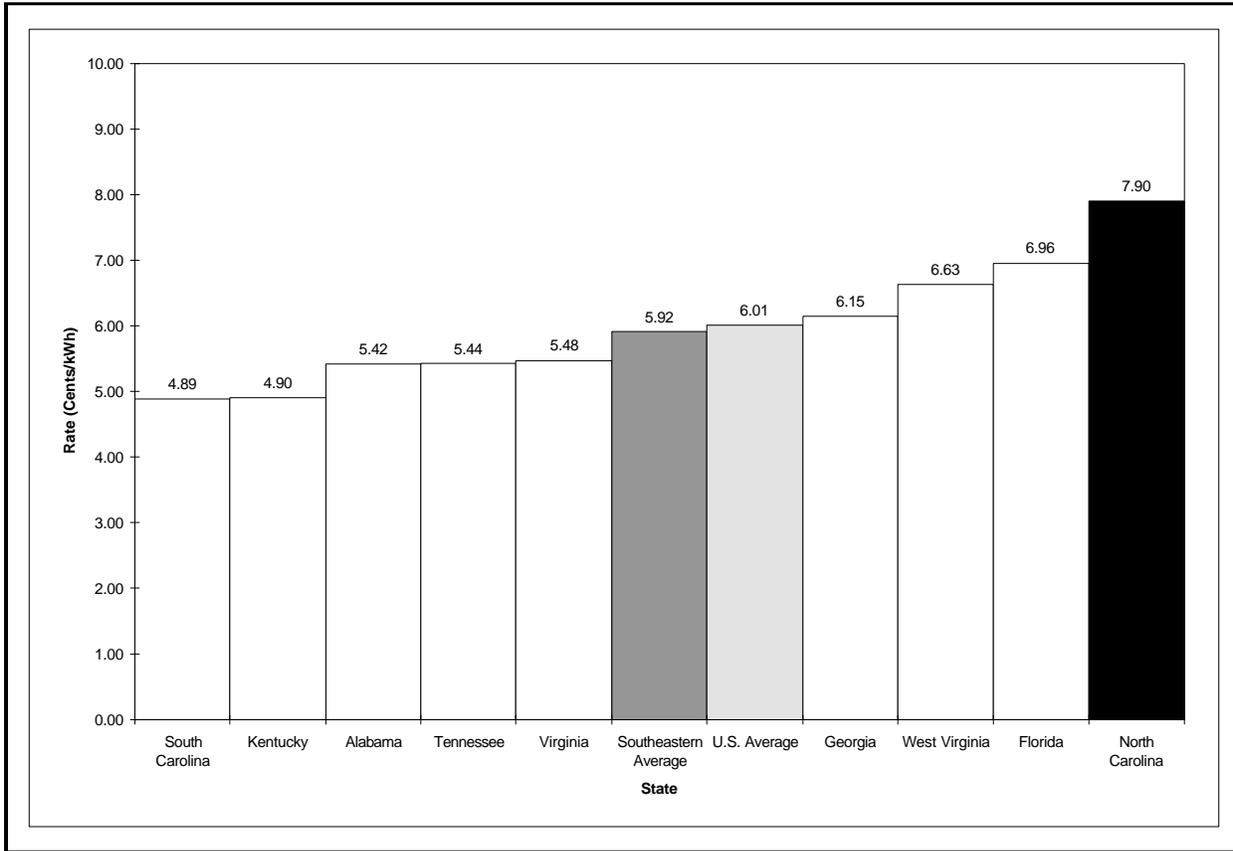
Figure 3-2. Interstate Comparison of 1996 Rates: IOUs



Munis

- Z The average electric rate for muni-provided electric service in North Carolina for all customer classes combined is 7.90¢/kWh, about 31 percent above the national average of 6.01¢/kWh.
- Z The average rate for muni-provided electric service in the southeast is 5.92¢/kWh. Among the nine southeastern states, North Carolina has the highest average muni electric rate for all customer classes combined, about 34 percent above the southeastern average.

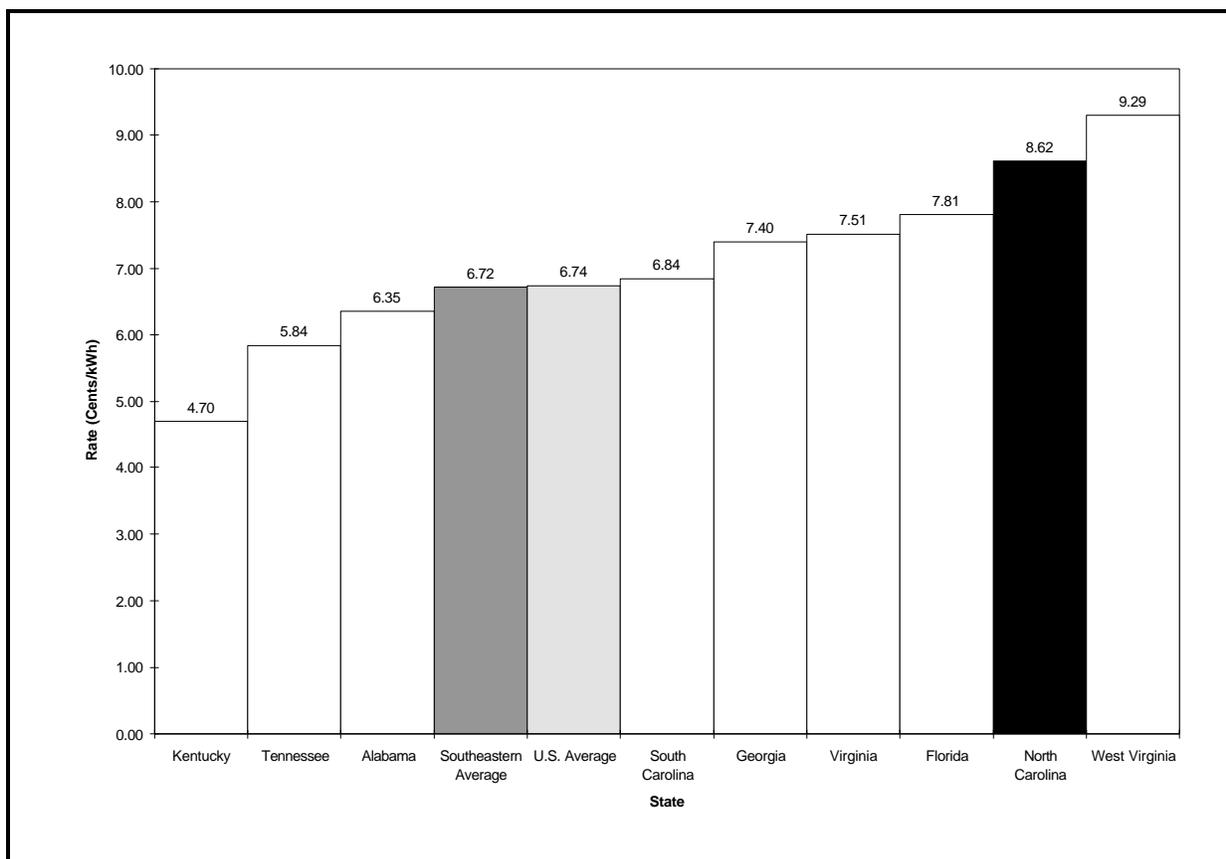
Figure 3-3. Interstate Comparison of 1996 Rates: Munis



Co-ops

- Z The average rate for electric service provided by co-ops in North Carolina for all customer classes combined is 8.62¢/kWh, about 28 percent above the national average of 6.74¢/kWh.
- Z The average rate for electric service provided by co-ops in the southeast is 6.72¢/kWh. Among the nine southeastern states, North Carolina has the second highest average co-op electric rate for all customer classes combined, about 28 percent above the southeastern average.

Figure 3-4. Interstate Comparison of 1996 Rates: Co-ops



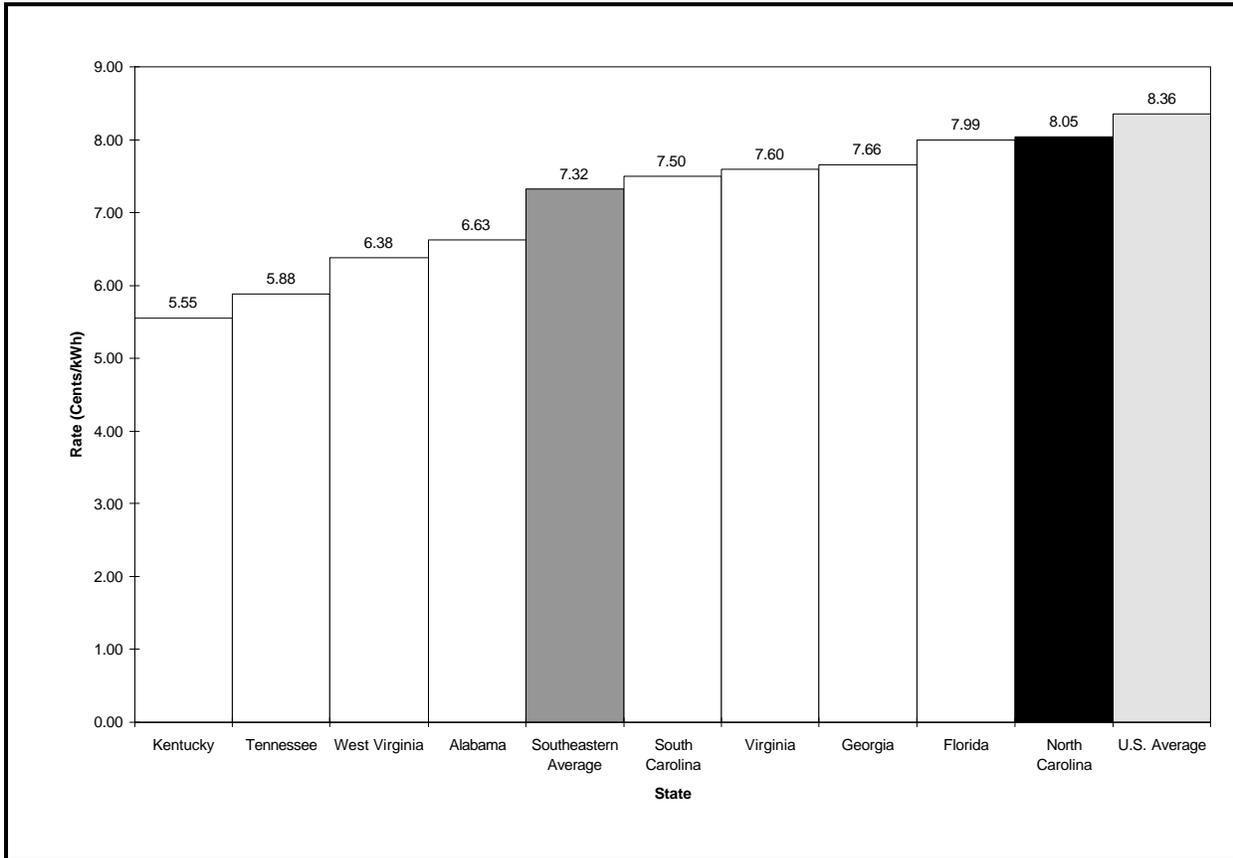
3.2.2 Comparisons by Customer Class

This section provides information on average retail rates for all provider groups combined (see Figures 3-5 through 3-7).

Residential

- Z The average rate for residential electric service in North Carolina for all provider groups combined is 8.05¢/kWh, about 4 percent below the national average of 8.36¢/kWh.
- Z The average rate for residential electric service in the southeast is 7.32¢/kWh. Among the nine southeastern states, North Carolina has the highest average residential electric rate, about 10 percent above the southeastern average.

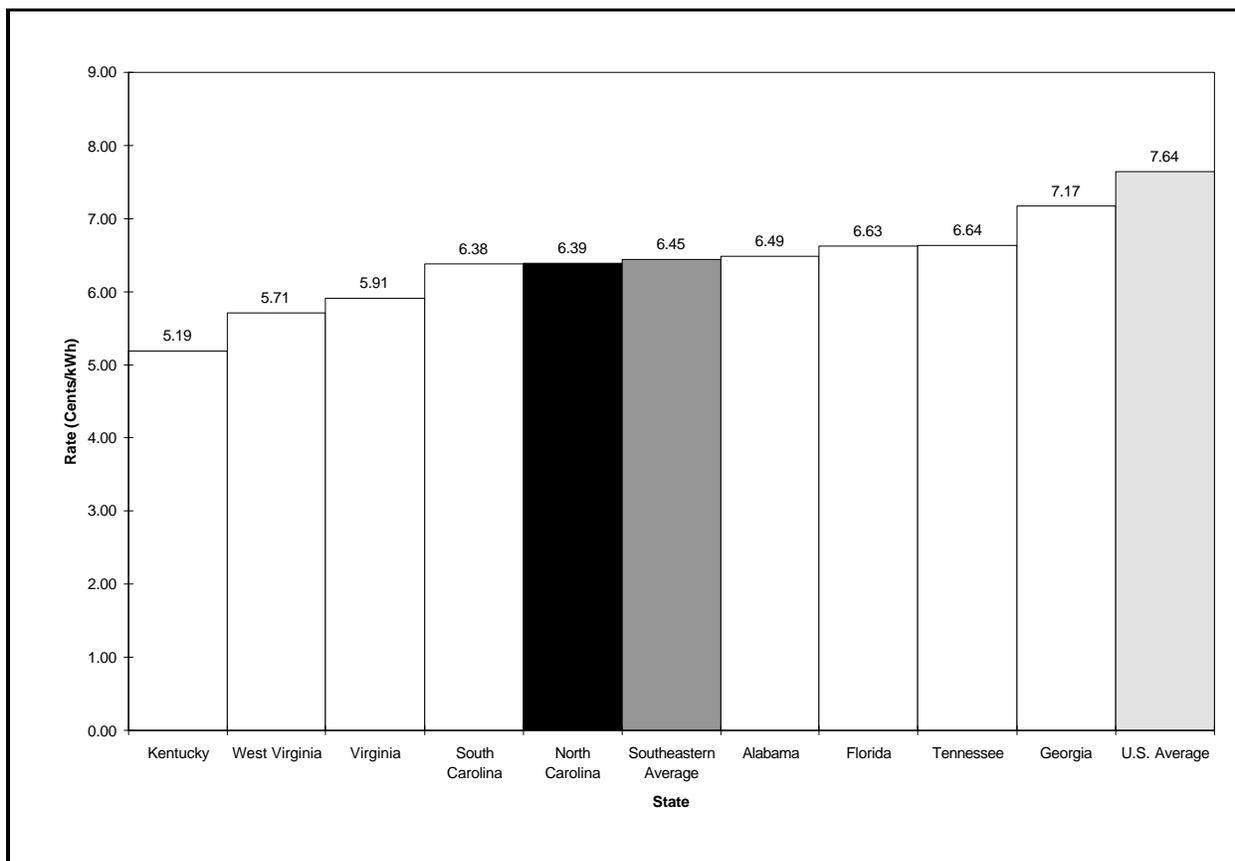
Figure 3-5. Interstate Comparison of 1996 Rates: Residential Customers



Commercial

- Z The average rate for commercial electric service in North Carolina for all provider groups combined is 6.39¢/kWh, about 16 percent below the national average of 7.64¢/kWh.
- Z The average rate for commercial electric service in the southeast is 6.45¢/kWh. Among the nine southeastern states, North Carolina has the fifth highest average commercial electric rate for all provider groups combined, less than 1 percent below the southeastern average.

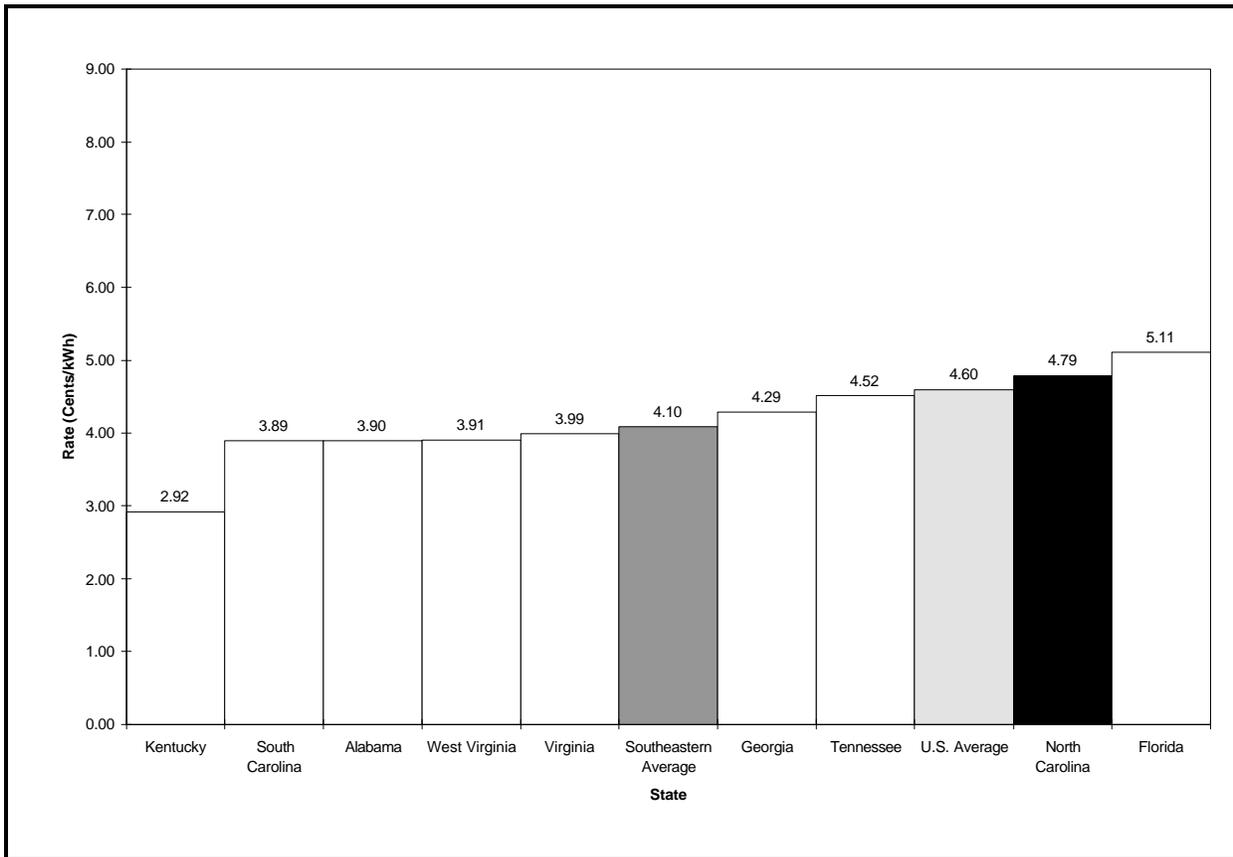
Figure 3-6. Interstate Comparison of 1996 Rates: Commercial Customers



Industrial

- Z The average rate for industrial electric service in North Carolina for all provider groups combined is 4.79¢/kWh, about 4 percent above the national average of 4.60¢/kWh.
- Z The average rate for industrial electric service in the southeast is 4.10¢/kWh. Among the nine southeastern states, North Carolina’s average industrial electric rate for all provider groups combined is second highest, about 17 percent above the southeastern average.

Figure 3-7. Interstate Comparison of 1996 Rates: Industrial Customers



3.3 INTRASTATE AVERAGE RATE COMPARISONS

Summary comparisons of 1996 average electric rates by customer class within North Carolina by provider group are presented below. Average U.S. electric rates by customer class and provider group for 1996 are included as reference points. The source of these data is the U.S. Department of Energy's Energy Information Administration Report DOE/EIA-0540(96) and associated databases. This is the same data source used for the interstate comparisons, ensuring that the same definitions and coverage are maintained for the comparisons.

Rates for each IOU are presented in the figures throughout this section, while rates for munis and co-ops are aggregated according to their affiliation with the municipal power agencies and NCEMC, respectively. Charts detailing rates for individual munis and co-ops are provided in Appendix D.

3.3.1 Comparisons by Provider Group

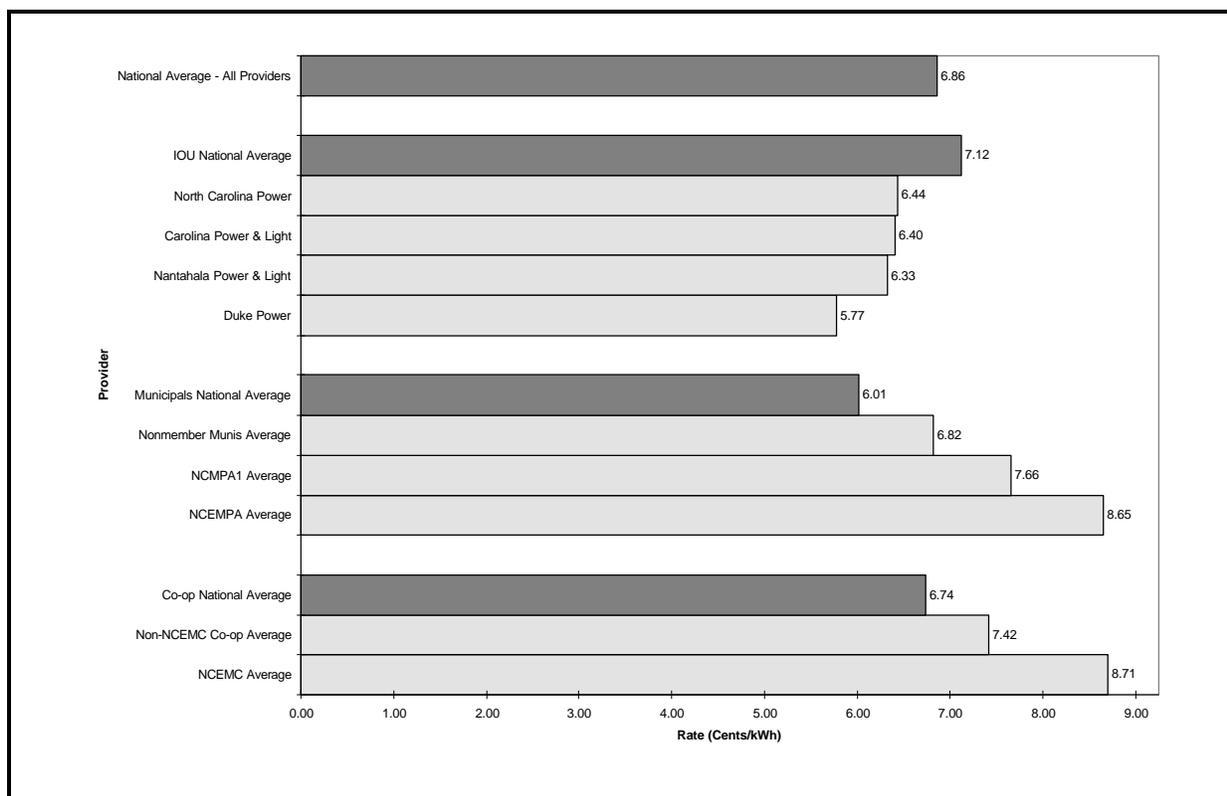
Figure 3-8 provides information on average retail rates for all customer classes, which includes other customers in addition to residential, commercial, and industrial customers.¹ Some examples of retail sales to these other customers include sales for public street and highway lighting, sales to public authorities, sales to railroads and railways, and interdepartmental sales.

IOUs

- Z In North Carolina, all four IOU providers (CP&L, Duke Power, Nantahala P&L, and NC Power) have an average electric rate for all customer classes combined that is below the U.S. average rate of 7.12¢/kWh.
- Z Of the four providers, Duke Power's average rate for all customer classes combined is lowest (5.77¢/kWh), and NC Power's is highest (6.44¢/kWh).

¹This helps explain why Duke Power has the lowest IOU rates for all customers combined while Nantahala has the lowest IOU rates for residential, commercial, and industrial customers.

Figure 3-8. Intrastate Comparison of 1996 Rates: All Customer Classes



Munis

- Z When all customer classes are blended together, the muni average rate is approximately 31 percent higher than the IOU average rate.
- Z All three muni provider groups (NCMPA1, NCEMPA, and agency nonmembers) have an average electric rate for all customer classes combined that is above the U.S. average rate of 6.01¢/kWh.
- Z Of the three muni provider groups, agency nonmembers have the lowest average rate (6.82¢/kWh) for all customer classes combined, and NCEMPA’s rate is highest (8.65¢/kWh). The munis with the lowest and highest average rates for all customer classes combined are as follows:

	Low	High
NCEMPA	Wilson (7.96¢/kWh)	Farmville (12.57¢/kWh)
NCMPA1	Monroe (6.70¢/kWh)	Cornelius (9.12¢/kWh)
Nonmember	Murphy (5.54¢/kWh)	Walstonburg ² (11.94¢/kWh)

²Purchases power from an NCEMPA member (Wilson).

Co-ops

- Z The co-op average rate is approximately 43 percent higher than the IOU average rate.
- Z Both co-op provider groups (NCEMC members and nonmembers) have an average electric rate for all customer classes combined that is above the U.S. average rate of 6.74¢/kWh.
- Z Of the two co-op provider groups, the NCEMC nonmember group has the lower average rate (7.42¢/kWh) for all customer classes combined. The co-ops with the lowest and highest average rates for all customers combined are as follows:

	Low	High
NCEMC	Four County (7.18¢/kWh)	Cape Hatteras (10.94¢/kWh)
Nonmember	Mountain (6.37¢/kWh)	Broad River (8.95¢/kWh)

3.3.2 Comparisons by Customer Class

Figures 3-9, 3-10, and 3-11 provide information on average retail rates for each customer class.

Residential

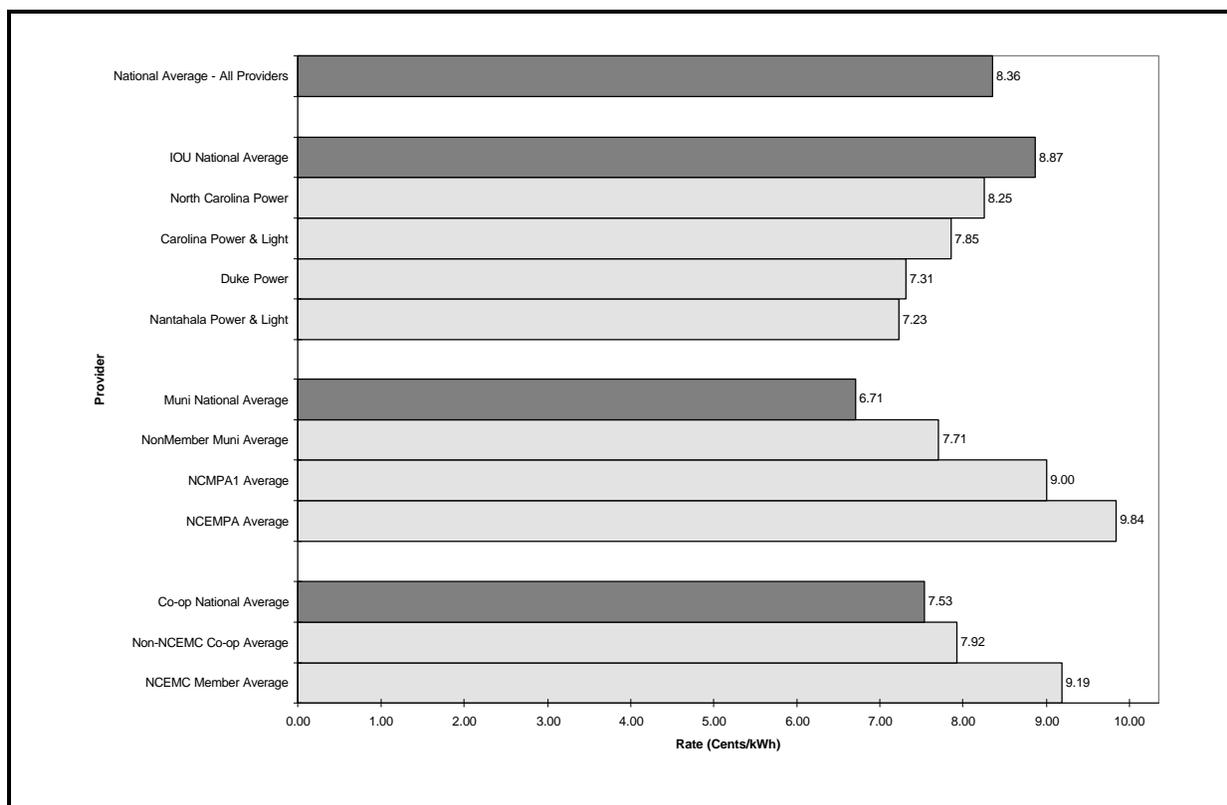
- Z Each of North Carolina’s IOUs provides residential electric service at an average rate below the U.S. IOU residential average rate of 8.87¢/kWh. Nantahala P&L’s rate is the lowest at 7.23¢/kWh, and NC Power’s rate is the highest at 8.25¢/kWh.
- Z The average residential electric rate for each of the three muni groups (NCEMPA at 9.84¢/kWh, NCMPA1 at 9.00¢/kWh, and agency nonmembers at 7.71¢/kWh) is higher than the U.S. residential average of 6.71¢/kWh for munis. The two munis that have an average residential electric rate below the national average for munis are not members of the municipal power agencies. The munis with the lowest and highest average residential rates are as follows:

	Low	High
NCEMPA	Lumberton (9.03¢/kWh)	Southport (15.89¢/kWh)
NCMPA1	Bostic ³ (7.23¢/kWh)	Granite Falls (9.61¢/kWh)
Nonmember	Murphy (6.02¢/kWh)	Fountain ⁴ (22.83¢/kWh)

³Bostic receives a large allocation of hydropower from the Southeastern Power Authority (SEPA).

⁴Purchases power from an NCEMPA member (Farmville).

Figure 3-9. Intrastate Comparison of 1996 Rates: Residential Customers



Z The average residential electric rates of 9.19¢/kWh for NCEMC members and 7.92¢/kWh for nonmembers are higher than the U.S. average of 7.53¢/kWh for electric co-ops. The three co-ops that have an average residential electric rate below the national average for electric co-ops are not NCEMC members. The co-ops with the lowest and highest average residential rates are as follows:

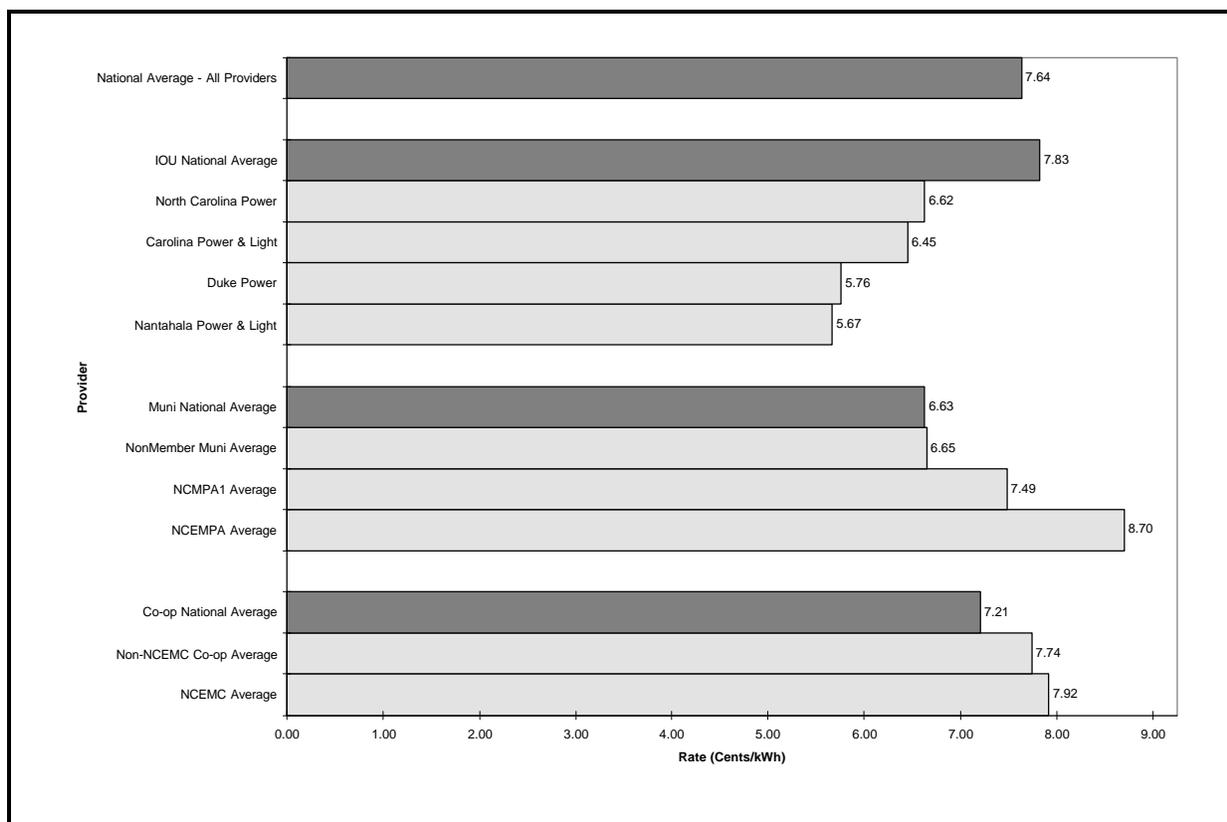
	Low	High
NCEMC	Rutherford (8.35¢/kWh)	Cape Hatteras (11.20¢/kWh)
Nonmember	Mountain (6.32¢/kWh)	French Broad (9.42¢/kWh)

Commercial

Z All four of North Carolina’s IOUs provide commercial electric service at an average rate below that of the U.S. average IOU commercial rate of 7.83¢/kWh. Nantahala P&L’s commercial rate is the lowest at 5.67¢/kWh, and NC Power’s rate is the highest at 6.62¢/kWh.

Z The average commercial electric rate for each of the three muni groups (NCEMPA at 8.70¢/kWh, NCMPA1 at 7.49¢/kWh, and agency nonmembers at 6.65¢/kWh) is higher than the U.S. commercial average of 6.63¢/kWh for munis. Of the six munis that provide commercial electric service at an average rate below the national commercial

Figure 3-10. Intrastate Comparison of 1996 Rates: Commercial Customers



average for munis, five are not members of the municipal power agencies and one is a member of NCEMPA. The munis with the lowest and highest average commercial rates are as follows:

	Low	High
NCEMPA	Southport (3.80¢/kWh)	Farmville (19.48¢/kWh)
NCMPA1	Newton (6.71¢/kWh)	Landis (10.43¢/kWh)
Nonmember	Fountain ⁵ (2.47¢/kWh)	Sharpsburg ⁶ (13.77¢/kWh)

Z The average commercial electric rates of 7.92¢/kWh for NCEMC members and 7.74¢/kWh for nonmembers are higher than the U.S. average of 7.21¢/kWh for co-ops. The four co-ops with average commercial rates below the national average for co-ops are NCEMC members. The co-ops with the lowest and highest commercial rates are as follows:

	Low	High
NCEMC	Edgecombe-Martin Co. (5.53¢/kWh)	Cape Hatteras (10.48¢/kWh)
Nonmember	Mountain (7.39¢/kWh)	Tri-State (8.46¢/kWh)

⁵Purchases power from an NCEMPA member (Farmville).

⁶Purchases power from an NCEMPA member (Rocky Mount) and CP&L.

Industrial

Z Three of North Carolina’s four IOUs provide industrial electric service at an average rate below the U.S. average IOU industrial rate of 4.71¢/kWh. CP&L’s average industrial rate of 5.03¢/kWh is higher than the national rate.

Z The average industrial electric rate for each of the three muni groups (NCEMPA at 6.68¢/kWh, NCMPA1 at 6.02¢/kWh, and agency nonmembers at 5.17¢/kWh) is higher than the U.S. average of 4.69¢/kWh for munis. The one muni that provides industrial electric service at an average rate below the national average for munis is not a member of the municipal power agencies. The munis with the lowest and highest average industrial rates are as follows:

	Low	High
NCEMPA	Kinston (5.88¢/kWh)	Belhaven (11.23¢/kWh)
NCMPA1	Lexington (5.41¢/kWh)	Lincolnton (7.65¢/kWh)
Nonmember	Fountain ⁷ (1.23¢/kWh)	Walstonburg ⁸ (17.71¢/kWh)

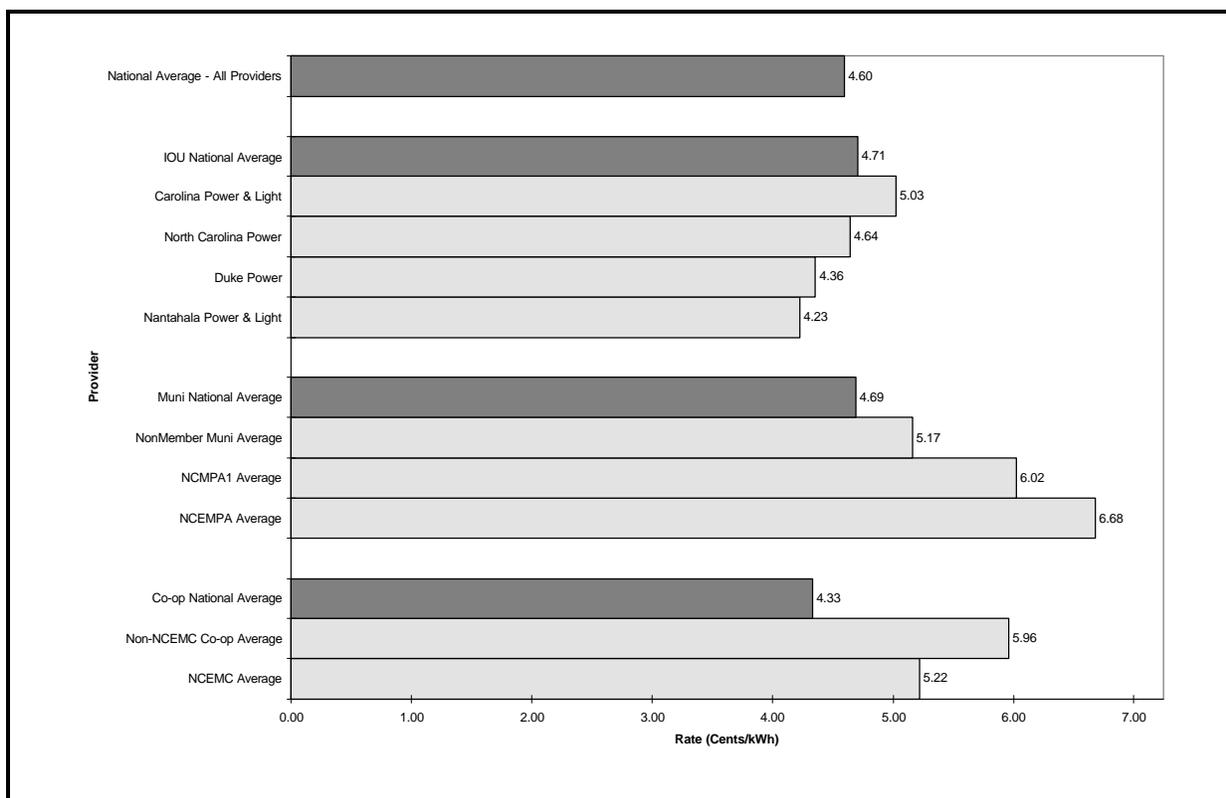
Z The average industrial rates of 5.22¢/kWh for NCEMC members and 5.96¢/kWh for nonmembers are higher than the U.S. average of 4.33¢/kWh for co-ops. The three co-ops that provide industrial electric service at an average rate below the national average for co-ops are members of NCEMC. The co-ops with the lowest and highest industrial rates are as follows:

	Low	High
NCEMC	Wake (3.34¢/kWh)	Haywood (9.90¢/kWh)
Nonmember	French Broad (5.79¢/kWh)	Blue Ridge Mountain (7.27¢/kWh)

⁷Purchases power from an NCEMPA member (Farmville).

⁸Purchases power from an NCEMPA member (Wilson).

Figure 3-11. Intrastate Comparison of 1996 Rates: Industrial Customers



Note: It should be noted that 10 NCEMC member cooperatives have no industrial rate because of the limited amount of industry in their service territory.

3.4 SUMMARY

North Carolina has retail electric rates that are approximately 5 percent below the national average when all providers and customer classes are blended together. Compared to the U.S., our industrial class rates average approximately 4 percent higher; our residential class rates, approximately 4 percent lower; and our commercial class rates, approximately 20 percent lower.

North Carolina's average retail electric rate is approximately 9 percent above the southeastern U.S. average when all providers and customer classes are blended together. Compared to the southeastern U.S., our industrial class rates average approximately 17 percent higher, our residential class rates average approximately 10 percent higher, and our commercial class rates average approximately 1 percent lower.

There are large disparities in average rates within North Carolina between IOUs on the one hand and munis and co-ops on the other. When all customer classes are blended together, the muni average rate is approximately 31 percent higher, and the co-op average rate is approximately 43 percent higher than the IOU average rate. Our muni and co-op average rates are higher than the national and southeastern U.S. average rates for these provider groups. When blended with our IOU rates, they pull our average rates up in comparison with those of other states.

All average rate comparisons are sensitive to the influence of many factors, including differences in

- Z customer mix (e.g., munis and co-ops have few industrial customers),
- Z customer usage within a customer class (e.g., residential customers in new suburbs tend to have larger kWh usage than urban or rural customers),
- Z costs to provide electrical service per kWh sold (e.g., service to rural customers requires larger distribution costs),
- Z differences in the mix and costs of generation, and
- Z differences in the rate schedules under which customers take electrical service.

The effect of kWh usage on average rates is addressed in Section 4. The effect of average rates on industrial development in North Carolina is addressed in Section 5.

4

Retail Rates by Usage Level

A key influence on the average rates presented in Section 3 is the mix of usage levels behind each rate. An average rate for any provider group or customer class may be low simply because kWh usage levels are large, not because the rates seen by individual customers are low.

This section uses available data to compare average rates for provider groups and customer classes at various kWh usage levels. Unlike Section 3, where data were obtained from the U.S. Department of Energy, the data in this section were collected from electricity providers in North Carolina by the North Carolina Public Staff in the fall of 1997 and provided to RTI to support its work on this task. These data are for broad-based rates and do not include special rates such as rates for energy conservation; load management; economic development; TOU; street and public lighting; traffic signals; and service to churches, schools, and public housing.

These comparisons are more detailed because they pare away the influence of kWh usage from the average rates in the previous section. The benefit is they provide a more “apples-to-apples” comparison of average rates. The downside is the comparisons require detailed data that are not available for all the providers or customer classes discussed in Section 3, which limits their scope.

4.1 TYPES OF RATES OFFERED

Data presented in this section are for the following customer categories:

- Z Residential—customers in residential dwelling units
- Z Small nonresidential customers with small to medium kW demand requirements
- Z Large nonresidential customers with large kW demand requirements.

These were the categories used by the electricity providers when they submitted these data to the North Carolina Public Staff. The small nonresidential category is comparable to the commercial category in the previous section, and the large nonresidential category is comparable to the industrial category.

The term “kW demand” refers to the rate at which electricity is consumed. It differs from “kWh consumption,” which refers to the amount of electricity consumed. The difference in kW demand and kWh consumption is analogous to the difference between a speedometer reading and an odometer reading in an automobile.

Some of the munis have developed a medium/large commercial customer rate to accommodate nonresidential customers that fall between small and large general service categories. For members of NCEMC, no data were provided for customers with demand higher than 1,500 kW/month.

4.2 COMPARISONS OF AVERAGE RATES BY USAGE LEVEL

Tables 4-1, 4-2, and 4-3 provide a representation of the average electric rate by usage level and classification, as described in Section 4.1, for North Carolina electricity providers. Both summer and nonsummer rates are indicated. It should be noted that members of the municipal power agencies and NCEMC do not serve as wide a customer base as the IOUs. Their customer base is primarily residential and small general service. The percentage of kWh sales to industrial customers is typically very small (e.g., 1 percent of total).

IOUs, on the other hand, have significant kWh sales to industrial customers. They provide an array of special rates for these customers, such as TOU rates, hourly pricing, interruptible service, and economic development rates. These special rates are typically much lower on a per-kWh basis than standard rates.

As in Section 3.3, rates for each IOU are presented in the tables throughout this section, while rates for members of the municipal power agencies and NCEMC are aggregated—no individual muni or co-op rates are presented in this section. Appendix E provides rate detail by muni. Rate detail by co-op was not provided to the Public Staff.

In addition to the findings for individual customer groupings, the three tables present some overall findings:

- Z Summer rates are higher than nonsummer rates.
- Z Members of the municipal power agencies and NCEMC have higher rates than IOUs in nearly every schedule category and at nearly every demand level.
- Z Within each customer class, the average rate generally declines as usage increases.
- Z Residential rates are lower than small and medium/large nonresidential service rates at low levels of consumption but higher at high levels of consumption.
- Z Large nonresidential service rates are consistently lower than small nonresidential service and residential rates.

Residential Customers

For residential customers, several findings are apparent in Table 4-1:

- Z IOUs are lower cost providers than municipal power agency members and NCEMC members.
- Z Nantahala is the lowest cost IOU provider at every usage level, and NC Power is the highest, except at the 2,000 kWh usage level during nonsummer months, in which case Duke is highest.
- Z NCMIPA1 members provide electricity at a lower average rate than NCEMPA members at every usage level.
- Z At the highest usage levels, NCEMC members provide electricity at a lower average rate than members of the municipal power agencies.
- Z At the lower usage levels, NCEMC members generally provide electricity at a lower average rate than NCEMPA members (except for the 300 kWh usage level during nonsummer months), but at a higher average rate than NCMIPA1 members.
- Z Within the municipal power agencies, the average annual rate for residential customers at the 2,000 kWh consumption level ranges from a low of 8.194¢/kWh to a high of 12.57¢/kWh among NCEMPA members, and a low of

6.59¢/kWh to a high of 9.33¢/kWh among NCMPA1 members.

Table 4-1. Average Electric Rates (in ¢/kWh) for Residential Customers

	kWh Usage				
	300	500	1,000	1,500	2,000
Summer					
IOUs					
CP&L	10.32	9.42	8.74	8.52	8.40
Duke	9.08	8.26	7.73	7.58	7.52
Nantahala	8.89	8.04	7.15	6.81	6.65
NC Power	11.10	9.83	8.88	8.57	8.41
Munis					
NCEMPA	12.55	11.44	10.58		10.19
NCMPA1	11.00	9.87	9.15		8.68
Co-ops					
NCEMC	11.45	10.16	9.15	8.80	8.63
Nonsummer					
IOUs					
CP&L	9.32	8.42	7.74	7.52	7.40
Duke	9.08	8.24	7.71	7.53	7.44
Nantahala	8.89	8.04	7.15	6.81	6.65
NC Power	10.10	8.83	7.88	7.57	7.41
Munis					
NCEMPA	12.40	11.29	10.41		9.98
NCMPA1	10.64	9.49	8.72		8.20
Co-op					
NCEMC	12.43	10.41	8.88	8.34	8.05

Note: Comparison rates listed for IOUs were taken from data compiled by the North Carolina Public Staff from IOU rate schedules. Rates for munis were provided to the Public Staff by Electricities for each muni and were aggregated and averaged across all munis employing summer/nonsummer rate schedules. Rates for co-ops were provided to the Public Staff by NCEMC. Data were not provided by Electricities for residential customers at the 1,500 kWh usage level.

Small and Medium/Large Nonresidential Customers

For small and medium/large nonresidential customers, several findings are apparent in Table 4-2:

- Z Generally, IOUs are lower cost providers than municipal power agency members and NCEMC members with a few exceptions—NCEMC members are lower than Duke Power at the two lowest usage levels and NCMAPA1 members are lower than CP&L and NC Power at the highest usage level among small nonresidential customers during the summer.
- Z In general, Nantahala is the lowest cost provider among the IOUs. CP&L and NC Power are lower at the 25 kW demand level.
- Z Duke Power is generally the highest cost provider among the IOUs. CP&L is higher at the 50 kW and 100 kW demand levels throughout the year—and NC Power is higher than Duke at the 50 kW and 100 kW demand levels during the summer.
- Z NCMAPA1 members provide electricity at a lower average rate than NCEMPA members at every usage level, except for medium/large nonresidential customers at the two lowest usage levels.
- Z NCEMC members provide electricity at a lower average rate than members of the municipal power agencies at nearly every usage level, with the exception of NCMAPA1 at the highest usage level for small nonresidential service customers.
- Z Within the municipal power agencies, the average annual rate for small nonresidential customers at the 1,800 kWh consumption level ranges from a low of 8.754¢/kWh to a high of 22.634¢/kWh among NCEMPA members, and a low of 9.124¢/kWh to a high of 13.984¢/kWh among NCMAPA1 members.
- Z Within the municipal power agencies, the average annual rate for medium/large nonresidential customers at the 36,000 kWh consumption level ranges from a low of 7.494¢/kWh to a high of 10.714¢/kWh among NCEMPA members, and a low of 5.644¢/kWh to a high of 7.724¢/kWh among NCMAPA1 members. It should be noted that not all members of NCEMPA and NCMAPA1 have customers at this level. The comparison is made only among the members with customers around this kWh consumption level.

Table 4-2. Average Electric Rates (in ¢/kWh) for Small and Medium/Large Nonresidential Customers

	kWh Usage (kW Demand)				
	360 (5)	720 (10)	1,800 (25)	18,000 (50)	36,000 (100)
Summer					
IOUs (Small Nonresidential Service)					
CP&L	11.89	10.23	8.22	6.14	6.10
Duke	12.37	10.86	9.95	6.03	5.88
Nantahala	11.49	8.96	8.64	5.51	5.47
NC Power	12.01	9.66	8.21	6.42	6.17
Munis (Small Nonresidential Service)					
NCEMPA	15.63	13.94	13.37	9.18	9.24
NCMPA1	14.81	12.72	11.46	7.63	6.04
Munis (Medium/Large Nonresidential Service)					
NCEMPA	14.27	11.69	13.77	8.46	8.42
NCMPA1	18.76	15.29	13.21	7.39	7.49
Co-ops (Small Nonresidential Service)					
NCEMC	12.05	10.51	10.80	6.96	6.63
Nonsummer					
IOUs (Small Nonresidential Service)					
CP&L	11.89	10.23	8.22	6.14	6.10
Duke	12.37	10.86	9.95	6.03	5.88
Nantahala	11.49	8.96	8.64	5.51	5.47
NC Power	11.40	9.06	7.61	5.82	5.57
Munis (Small Nonresidential Service)					
NCEMPA	15.66	13.98	13.39	9.13	9.18
NCMPA1	14.65	12.56	11.30	7.27	5.96
Munis (Medium/Large Nonresidential Service)					
NCEMPA	14.27	11.69	13.77	8.46	8.42
NCMPA1	18.76	15.29	13.21	6.68	6.77
Co-ops (Small Nonresidential Service)					
NCEMC	11.97	10.42	10.64	6.93	6.58

Note: Comparison rates listed for IOUs were taken from data compiled by the North Carolina Public Staff. The origin of this data is the appropriate customer class rate schedules of each IOU, also provided to the Public Staff. Rates listed for munis were provided for each individual municipal and were aggregated and averaged across all those employing summer/nonsummer rate schedules. Rates listed for co-ops are also those as provided to the Public Staff.

Large Nonresidential Customers

Average electric rates for large nonresidential customers are presented in Table 4-3. Readers should note that these are average rates for customers assumed to have these levels of kWh consumption. They are not actual customer data. IOUs have customers around each of these kWh consumption levels, but munis and co-ops have no customers at the higher levels. Typically, the dispersion of actual kWh consumption around these levels increases as the levels increase. Consequently, the dispersion of bills and average rates increases as these kWh consumption levels increase. To illustrate this point, industrial customers with high kWh consumption and kW demand may be offered rate schedules that result in average electric rates as much as a penny per kWh lower than the rates shown in Table 4-3.

Several findings are apparent in Table 4-3:

- Z IOUs are lower cost providers than municipal power agency members and NCEMC members.
- Z Nantahala is the lowest cost provider at every usage level among the IOUs. CP&L is generally the highest cost provider among the IOUs, although NC Power is higher at the 25,000 and 50,000 kW demand levels during the summer.
- Z NCMIPA1 members currently provide electricity at a lower average rate than NCEMPA members at every usage level.
- Z In the summer, NCEMC members provide electricity at a lower average rate than members of the municipal power agencies at the two lowest demand levels.
- Z Within the municipal power agencies, the average annual rate for large nonresidential customers at the 540,000 kWh consumption level ranges from a low of 7.824¢/kWh to a high of 8.294¢/kWh among NCEMPA members, and a low of 5.624¢/kWh to a high of 6.764¢/kWh among NCMIPA1 members. It should be noted that not all members of NCMIPA1 and relatively few members of NCEMPA have customers at this level. The comparison is made among those members with customers around this kWh consumption level.

Table 4-3. Average Electric Rates (in ¢/kWh) for Large Nonresidential Customers

	kWh Usage (kW Demand)					
	450,000 (1,250)	540,000 (1,500)	1,800,000 (5,000)	3,600,000 (10,000)	9,000,000 (25,000)	18,000,000 (50,000)
Summer						
IOUs						
CP&L	6.50	6.48	6.41	6.26	6.00	5.92
Duke	5.27	5.20	4.92	4.86	4.83	4.82
Nantahala	4.60	4.57	4.44	4.42	4.40	4.40
NC Power	6.25	6.25	6.24	6.24	6.24	6.24
Munis						
NCEMPA	7.49	7.94	7.99	6.69		
NCMPA1	6.65	6.67	6.53	6.35		
Co-ops						
NCEMC	6.54	6.53				
Nonsummer						
IOUs						
CP&L	6.50	6.48	6.41	6.26	6.00	5.92
Duke	5.27	5.20	4.92	4.86	4.83	4.82
Nantahala	4.60	4.57	4.44	4.42	4.40	4.40
NC Power	5.75	5.74	5.73	5.73	5.73	5.73
Munis						
NCEMPA	7.49	7.94	7.99	6.69		
NCMPA1	6.24	6.23	6.25	6.35		
Co-ops						
NCEMC	6.48	6.48				

Note 1: Comparison rates listed for IOUs were taken from data compiled by the North Carolina Public Staff. The origin of this data is the appropriate customer class rate schedules of each IOU, also provided to the Public Staff. Rates listed for munis were provided for each individual municipal and were aggregated and averaged across all those employing summer/nonsummer rate schedules. Rates listed for co-ops are also those as provided to the Public Staff. For NCEMC, no data were provided for customers with demand higher than 1,500 kW per month. For NCEMPA and NCMPA1, no data were provided for customers with demand higher than 10,000 kW per month.

Note 2: IOUs typically have larger customers than are represented above. Rates for these very large customers will typically be below those shown above to reflect higher load factors (average kWh usage per kW demand during the billing period) and the application of industrial TOU rates, hourly pricing rates, and other rate options.

4.3 SUMMARY

Based on the data in this section, it is clear that North Carolina IOUs typically provide service to all customer classes at average rates that are lower than average rates for munis and co-ops in the state. The one exception is that NCEMC members on average provide service to small nonresidential customers with low kW demand at a lower average rate than Duke Power. As noted previously, however, average rates by usage level are not available from 20 munis that are not members of the municipal power agencies and 5 co-ops that are not members of NCEMC. None of these compilations include special rates, such as lower rates for energy conservation or load management.

As in Section 3, the rate variations are larger for some comparisons than in others. The variations across munis are much larger than across IOUs. Similarly, rates by kWh consumption level vary extensively, especially among munis.

Variations in rates at a given consumption level reflect differences in the costs of serving customers at that level. Providers with fewer customers and with customers who are more geographically dispersed will have higher rates for most, if not all, of the kWh consumption levels.

5

Electric Rates and Industrial Competitiveness

A key economic issue associated with retail electric rates is their effect on industrial competitiveness. This section examines the role of electric rates in industrial location and North Carolina's recent experience in industrial recruiting.

5.1 INDUSTRIAL SITE SELECTION PROCESS AND CONSIDERATIONS

The industrial site selection process typically involves three major stages:

- Z Select region of U.S.
- Z Select state within region
- Z Select site.

This characterization of the site selection process is highly simplified, but it provides a useful framework in which to consider the various factors that are considered in industrial site selection.

The regional decision is primarily driven by a comparison of the geographic markets a prospect serves relative to the location of the prospect's existing facilities. If market growth is occurring in a region where a prospect has no facilities, the prospect may select that region for a new facility. If market growth is occurring in a region where a prospect has a facility or where it has a facility in a nearby region, the existing facility may be expanded to serve the market growth.

Costs of inputs into the production of a product or service may play a role in the regional selection process, but if they do, it is typically a secondary role. The major exception is the case of resource-intensive industries. For example, aluminum facilities, which are very large users of electricity, have historically located where large, inexpensive hydropower resources are available (e.g., the Pacific Northwest). Another example of a resource-intensive industry is the pulp and paper industry, whose facilities locate near extensive forest resources.

Growth in recent years has been more rapid in industries that are “footloose” (i.e., their locations are not dictated by the markets they serve or the physical resources they use). A key reason for this development is expanded transportation and communication services at lower cost.

Costs and availability of inputs are primary drivers at the second stage (state within region) of the location process. Inputs at the broad level include labor, land, capital, raw materials, and utility and energy costs. The importance of these costs in this stage of the location decision process depends on the importance of these costs in the production process of the product or service. For example a labor-intensive industry such as apparel will primarily be concerned with labor availability and costs. As another example, “high tech” industries such as semiconductors and software will be primarily concerned with the availability of high-skilled labor and educational and cultural resources. Energy-intensive industries (i.e., industries that use large amounts of energy in their production process relative to other inputs like primary metals, stone, clay, and glass) are sensitive to energy prices.

Another set of considerations at the second stage are ones typically included in the category of “general business climate.” This category includes considerations such as taxes, environmental regulations, restrictions on business activity, and work rules. In recent years, in part because of the strong competition among states for industrial prospects, disparities in these factors have narrowed and these considerations have played less of a role overall. However, this competition has also fostered incentive packages for target prospects in which some of these factors may be emphasized (e.g., tax concessions).

The third stage involves selecting a specific site within a state. Site candidates are typically narrowed to a small number (e.g., three) and evaluated on the basis of considerations such as transportation access, availability of key resources (e.g., water, natural gas), and local living conditions and amenities. Large differences in electric rates within a state can also influence site selection at this stage, particularly for electricity-intensive industries.

5.2 ELECTRICITY PRICES AND INDUSTRY COMPETITIVENESS

Although electricity prices are but one of many factors that can affect industrial competitiveness, and thus new location, expansion, and relocation decisions, the importance of electricity prices in these decisions rises for industries with production processes that are electricity intensive. A list of the 40 industries with the highest electricity-intensiveness at the national level is presented in Appendix F. Industries in this appendix are presented at the U.S. Department of Commerce three-digit Standard Industrial Classification (SIC) code level. This appendix indicates the share of electricity in their input costs and their employment growth in the U.S. and North Carolina over the recent past.

North Carolina contains far more than the national average of electricity-intensive industries, as seen in Table 5-1.

Table 5-1. Employment in the 40 Most Electricity-Intensive Industries, by State

	Percentage of Total Employment	Percentage of Manufacturing Employment
North Carolina	10.41	35.78
South Carolina	12.33	45.82
Georgia	5.18	25.29
Virginia	4.16	25.51
Tennessee	6.38	25.58
United States	3.78	20.35

Source: County Business Patterns, 1996—see Appendix F.

Counties with the highest proportion of jobs from North Carolina's electric-intensive industries are:

County	Percentage of NC Jobs
Alamance	4%
Cabarrus	3%
Catawba	6%
Cleveland	3%
Forsyth	3%
Gaston	6%
Guilford	5%
Mecklenburg	4%
Randolph	3%
Rockingham	3%
Rutherford	3%
Surry	3%

Within the smaller counties of Rockingham, Rutherford, and Surry (as well as in Chatham, Montgomery, and Yadkin counties), jobs in electricity-intensive industries comprise more than 25 percent of total county employment.

5.3 RECENT NORTH CAROLINA INDUSTRIAL DEVELOPMENT EXPERIENCE

Overall, North Carolina's industrial recruitment success rate does not appear to have been influenced in a major way by electricity prices in the state relative to those in neighboring states. In fact, North Carolina has been one of the most successful states in industrial recruitment within the southeast as well as within the U.S. These success rates are reflected in Tables 5-2 through 5-4, where the indicators in each table are presented on a per capita basis.

Table 5-2 indicates that North Carolina led the nation in 1997 and over the 3-year period from 1995 through 1997 in terms of the number of new and expanded facilities per capita. The 1997 performance helped to pull North Carolina's ranking up from fifth over the 3-year period 1994 through 1996.

Table 5-2. 1995 Through 1997 Top 10 States: New/Expanded Facilities per One Million Population

1.	North Carolina (5) [1]	316
2.	Ohio (2) [2]	261
3.	Michigan (n/r) [1]	210
4.	Kentucky (3) [12]	194
5.	South Carolina (7) [10]	168
6.	South Dakota (n/r) [37]	165
7.	Texas (n/r) [3]	131
8.	Nevada (n/r) [15]	130
9.	Louisiana (10) [13]	128
10.	Arizona (8) [20]	124

() = 1994 through 1996 top 10 rank, facilities-expanded/1 million.

[] = 1997 rank, new facilities/expanded.

Source: Site Selection's New Plant database; "n/r" denotes not ranked.

Table 5-3 indicates that North Carolina led the nation over the 1995 through 1997 and 1994 through 1996 periods in terms of employment in new and expanded facilities per capita. Its 1997 ranking, fifth in the nation, was not low enough to affect the latest 3-year ranking. Its 1997 ranking was also the highest among the southeastern states—Florida ranked seventh and South Carolina tenth.

Table 5-3. 1995 Through 1997 Top 10 States: New Jobs per One Million Population

1.	North Carolina (1) [5]	15,545
2.	Oklahoma (2) [29]	13,576
3.	South Carolina (7) [10]	12,194
4.	Mississippi (3) [24]	11,904
5.	Kentucky (5) [12]	11,873
6.	Texas (n/r) [3]	10,474
7.	Florida (n/r) [7]	10,307
8.	Arizona (4) [29]	10,095
9.	South Dakota (n/r) [37]	9,768
10.	Virginia (6) [17]	8,999

() = 1994 through 1996 top 10 rank, jobs/1 million.

[] = 1997 rank in new facilities/expanded.

Source: Site Selection's New Plant database; "n/r" denotes not ranked.

Table 5-4 indicates that North Carolina is among the top ten states nationally in terms of investment in new and expanded facilities per capita. Its 1997 ranking, fifth, pulled its 3-year ranking up from tenth in 1994 through 1996 to eighth in 1995 through 1997. Its 1997 ranking was highest among the southeastern states—South Carolina ranked tenth and Virginia seventeenth.

Table 5-4. 1995 Through 1997 Top 10 States: Investment per One Million Population

1.	Nevada (1) [15]	\$3.69
2.	South Carolina (4) [10]	\$3.25
3.	Louisiana (2) [13]	\$2.96
4.	Michigan (n/r) [1]	\$2.42
5.	Indiana (8) [9]	\$2.24
6.	Oregon (3) [38]	\$2.23
7.	Ohio (7) [2]	\$1.80
8.	North Carolina (10) [5]	\$1.72
9.	Virginia (6) [17]	\$1.62
10.	Alabama (5) [21]	\$1.58

() = 1994 through 1996 top 10 rank, \$/1 million population.

[] = 1997 rank in new facilities/expanded.

(Figures in \$U.S. billions).

Source: Site Selection's New Plant database; "n/r" denotes not ranked.

5.4 SUMMARY

To summarize, many factors are considered in the site selection process, and electricity is but one of those factors. The importance of electricity prices in industrial competitiveness is primarily related to the electricity-intensiveness of the industries. Electricity prices can have a noticeable effect on recruitment and retention of these industries primarily when the price differences are large and when they exist between adjoining or close-proximity utility service territories.

Compared to other states, North Carolina does have a high concentration of employment in electricity-intensive industries. In addition, North Carolina's average electricity rates are higher than those in surrounding states. However, these differences have not had

a noticeable impact on industrial location and expansion. In fact, North Carolina leads the southeast in this regard.

References

County Business Patterns. 1996.

Site Selection's New Plant database.

U.S. Department of Commerce, Bureau of the Census. *Country Business Patterns* (various years). Washington, DC: Government Printing Office.

U.S. Department of Energy DOE/EIA-0540(96).

A

North Carolina Municipal Electric Utilities

Members of the North Carolina Eastern Municipal Power Agency

Apex	Hertford	Robersonville
Ayden	Hobgood	Rocky Mount
Belhaven	Hookerton	Scotland Neck
Benson	Kinston	Selma
Clayton	La Grange	Smithfield
Edenton	Laurinburg	Southport
Elizabeth City	Louisburg	Tarboro
Farmville	Lumberton	Wake Forest
Fremont	New Bern	Washington
Greenville	Pikeville	Wilson
Hamilton	Red Springs	

Members of the North Carolina Municipal Power Agency #1

Albemarle	High Point	Morganton
Bostic	Huntersville	Newton
Cherryville	Landis	Pineville
Cornelius	Lexington	Shelby
Drexel	Lincolnton	Statesville
Gastonia	Maiden	
Granite Falls	Monroe	

**Other Municipal Electric Utilities
(not members of the municipal power agencies)**

Boone	Fountain ^a (Farmville)	Sharpsburg ^a (Rocky Mount)
Black Creek ^a (Wilson)	Highlands	Stantonsburg ^a (Wilson)
Chapel Hill	Kings Mountain	Walstonburg ^a (Wilson)
Concord	Lucama ^a (Wilson)	Waynesville
Cullowhee	Macclesfield ^a (Wilson)	Windsor
Dallas	Murphy	Winterville ^a (Greenville)
Enfield	Oak City ^b (Edgecombe-Martin County EMC)	
Fayetteville	Pinetops ^a (Wilson)	
Forest City		

^aAs of 1996, served by a municipal power agency member (in parenthesis), either directly or indirectly.

^bAs of 1996, served by a North Carolina Electric Membership Corporation Member (in parenthesis).

B

North Carolina Rural Electric Cooperatives

Members of the North Carolina Electric Membership Corporation

Albemarle EMC	Four County EMC	Roanoke EMC
Blue Ridge EMC	Halifax EMC	Rutherford EMC
Brunswick EMC	Harkers Island EMC	South River EMC
Cape Hatteras EMC	Haywood EMC	Surry-Yadkin EMC
Carteret-Craven EMC	Jones-Onslow EMC	Tideland EMC
Central EMC	Lumbee River EMC	Tri-County EMC
Crescent EMC	Pee Dee EMC	Union EMC
Davidson EMC	Piedmont EMC	Wake EMC
Edgecombe-Martin Co. EMC	Pitt & Greene EMC	
	Randolph EMC	

Other Rural Electric Cooperative (not a member of NCEMC)

French Broad EMC

Co-ops serving North Carolina but headquartered outside the state

Blue Ridge Mountain EMC	Broad River ECI Mountain ECI	Tri-State EMC
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C

Average Electric Rates for U.S. States

The charts in this appendix present the average electric rate for every state. Figure C-1 provides the data by provider group, while Figure C-2 is broken down by customer class.

Figure C-1. Average Electric Rate by Provider Group

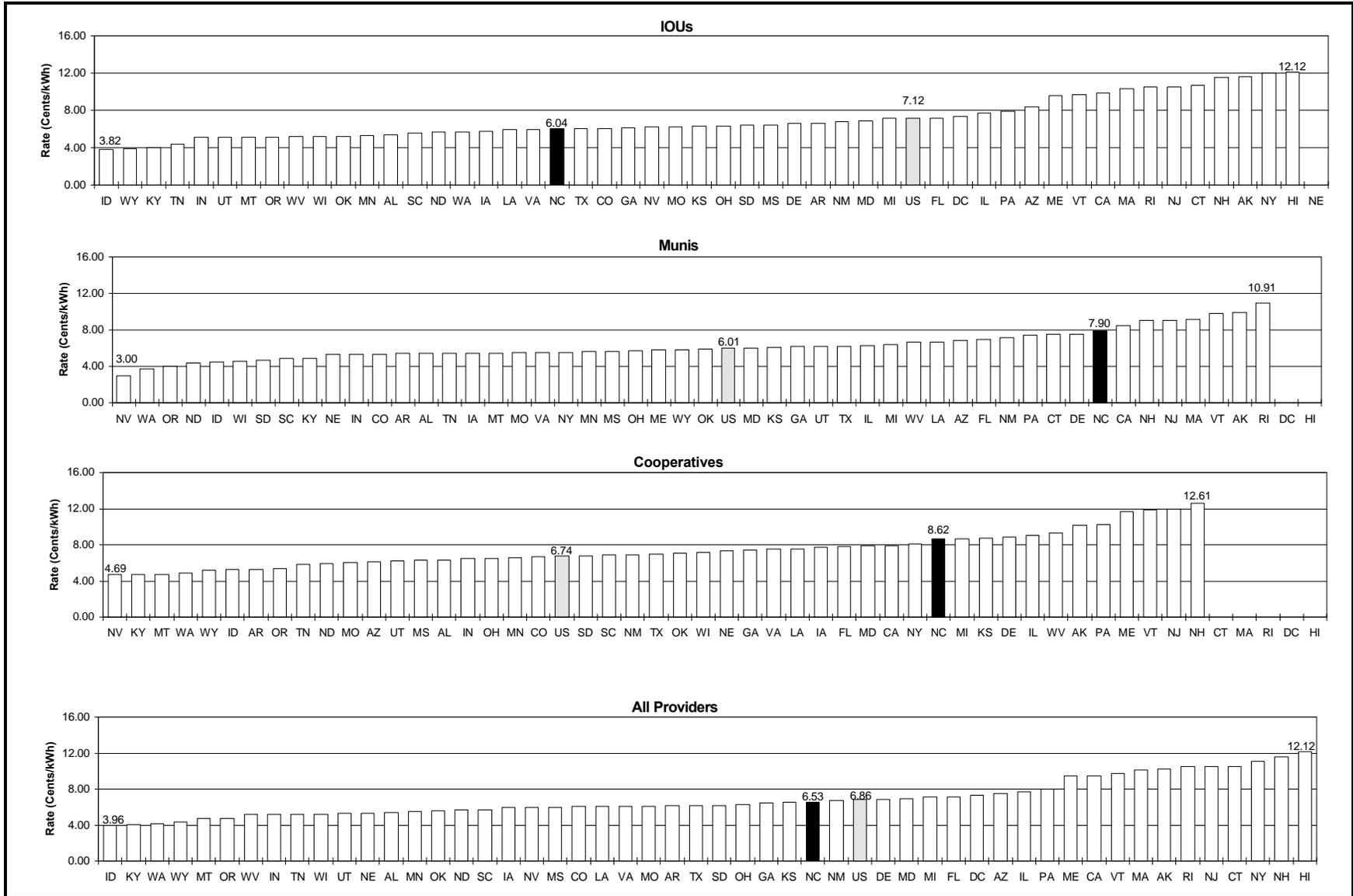
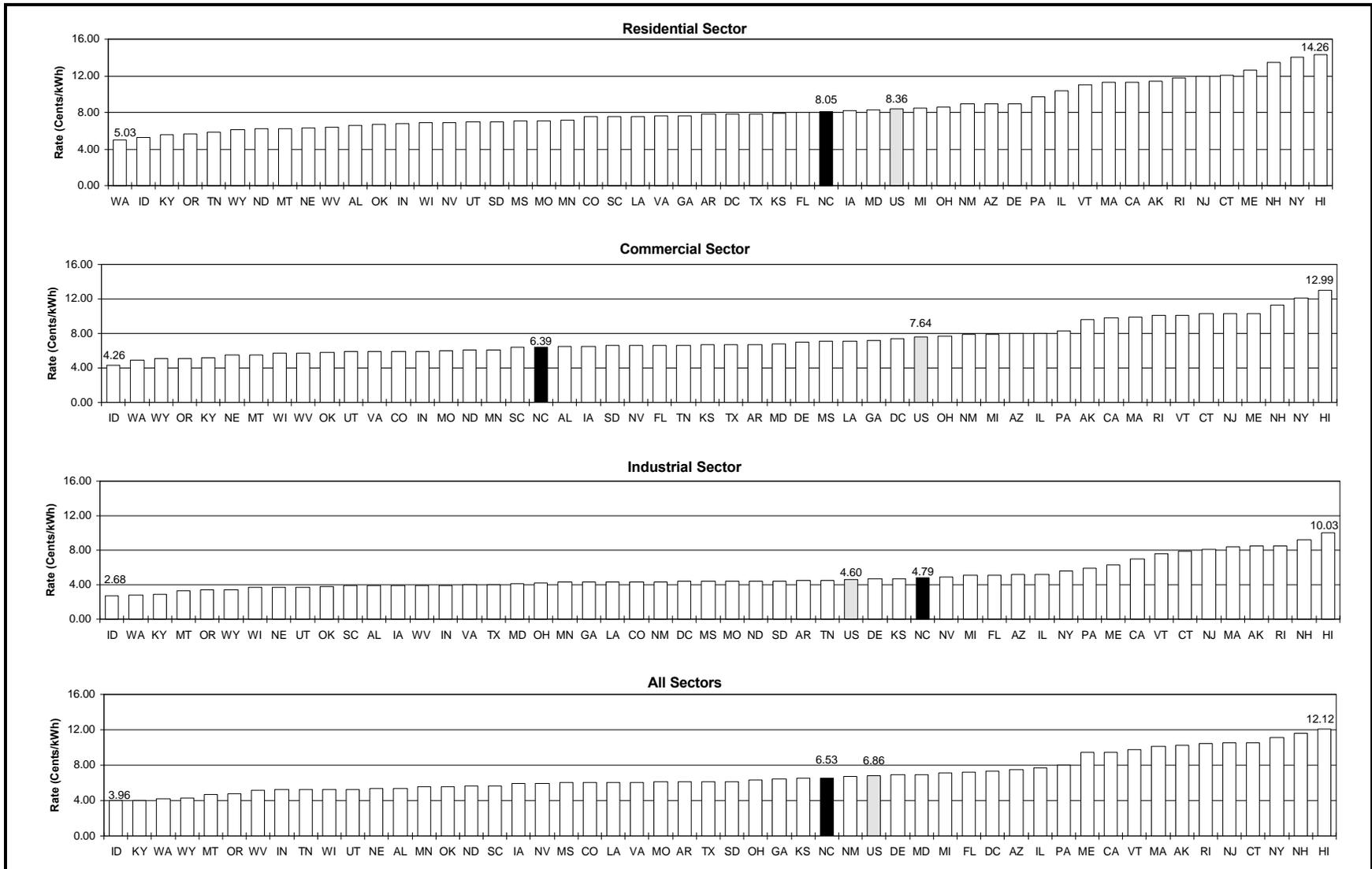


Figure C-2. Average Electric Rate by Customer Class

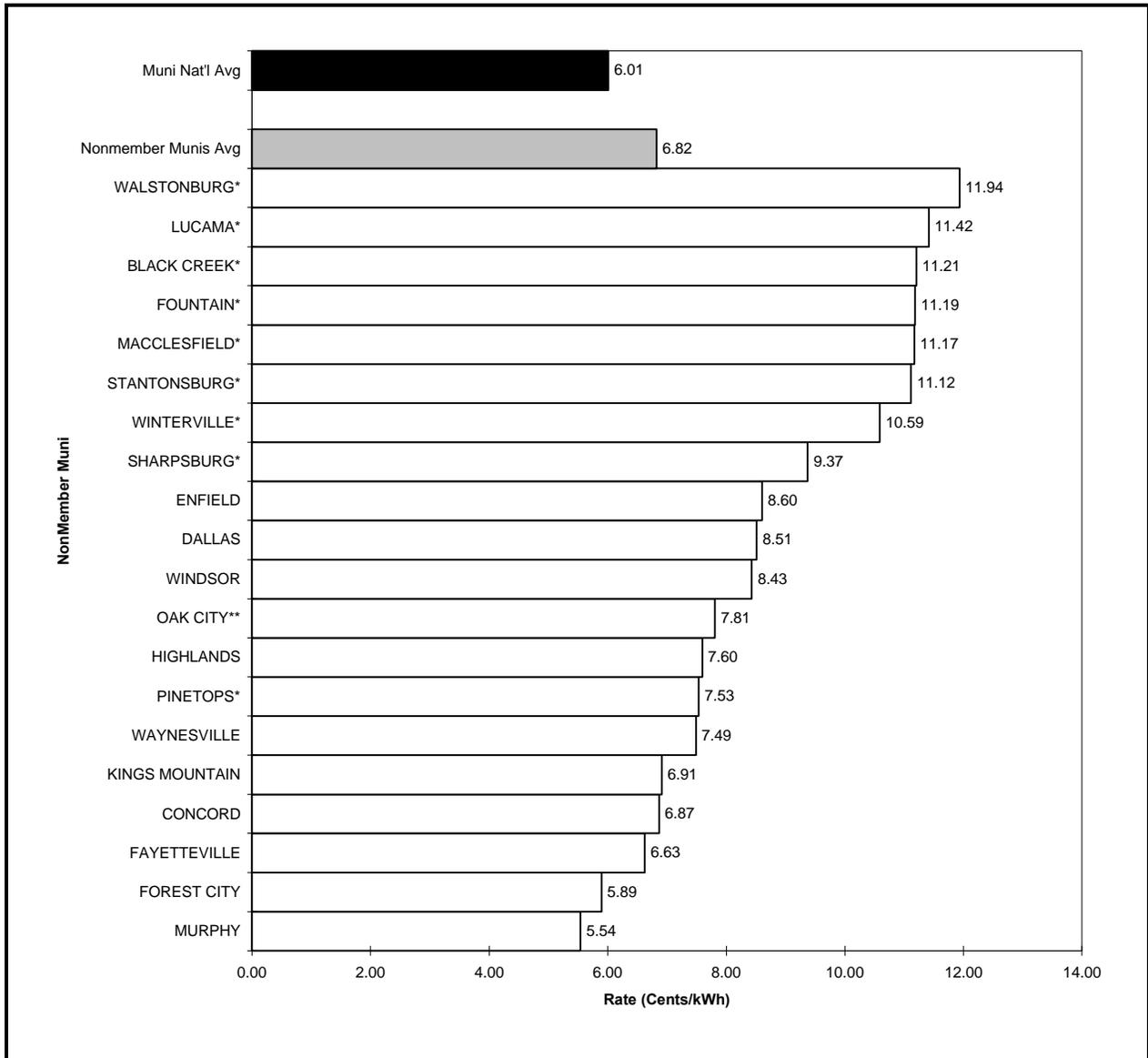


D

Average Electric Rates for Munis and Co-ops

The charts in this appendix correspond to Figures 3-8 through 3-11, presenting average retail rates for individual munis and co-ops in North Carolina. Figure D-1 comprises four charts that present average rate information for all customer classes. The charts in Figure D-2 present average rates for residential customers. Figure D-3 covers commercial customers, and Figure D-4's charts present data for industrial customers.

Figure D-1-i. Average Rate for All Customer Classes: Municipal Power Agency Nonmembers

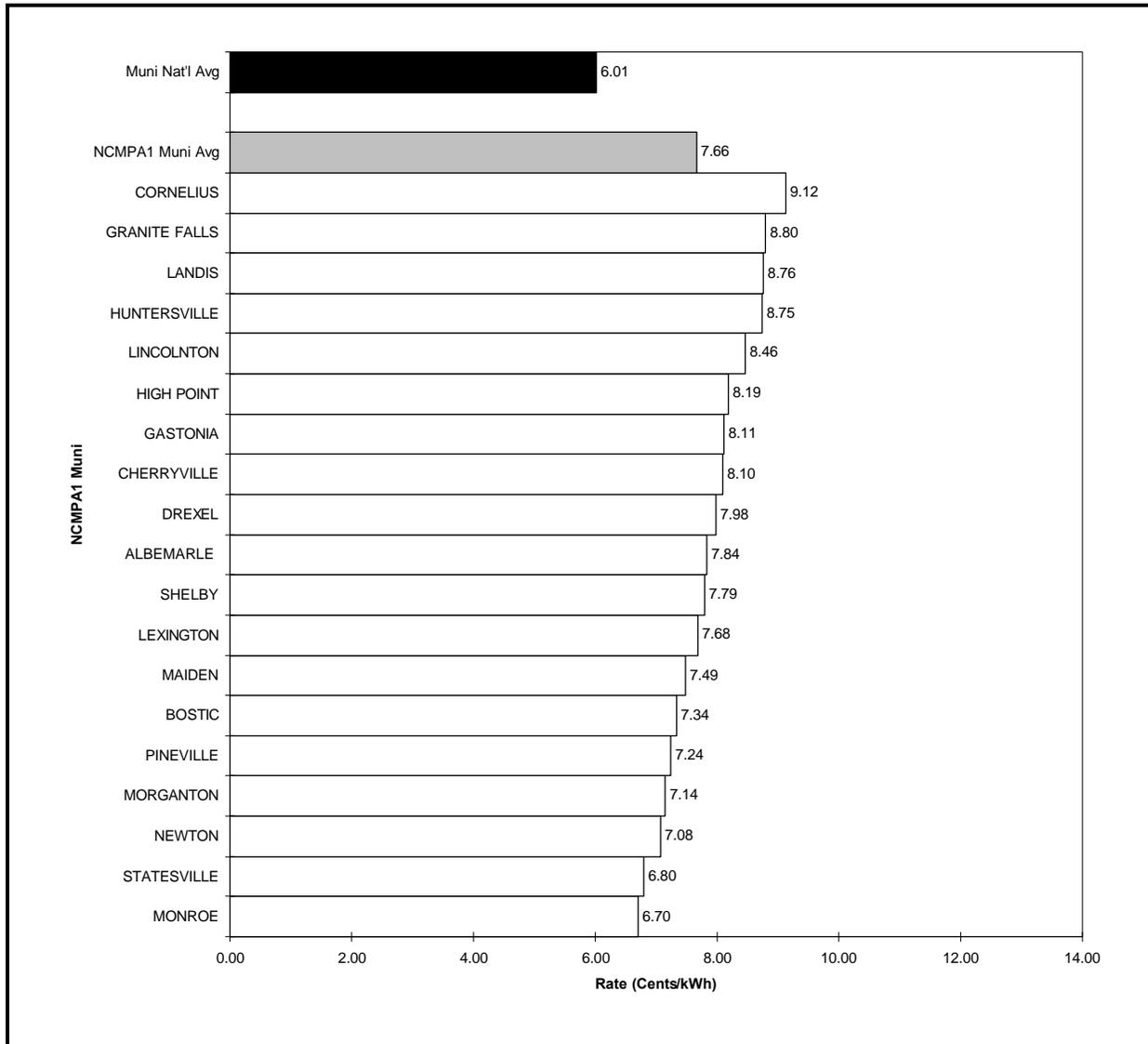


This figure corresponds to Figure 3-8.

* Served by a municipal power agency member.

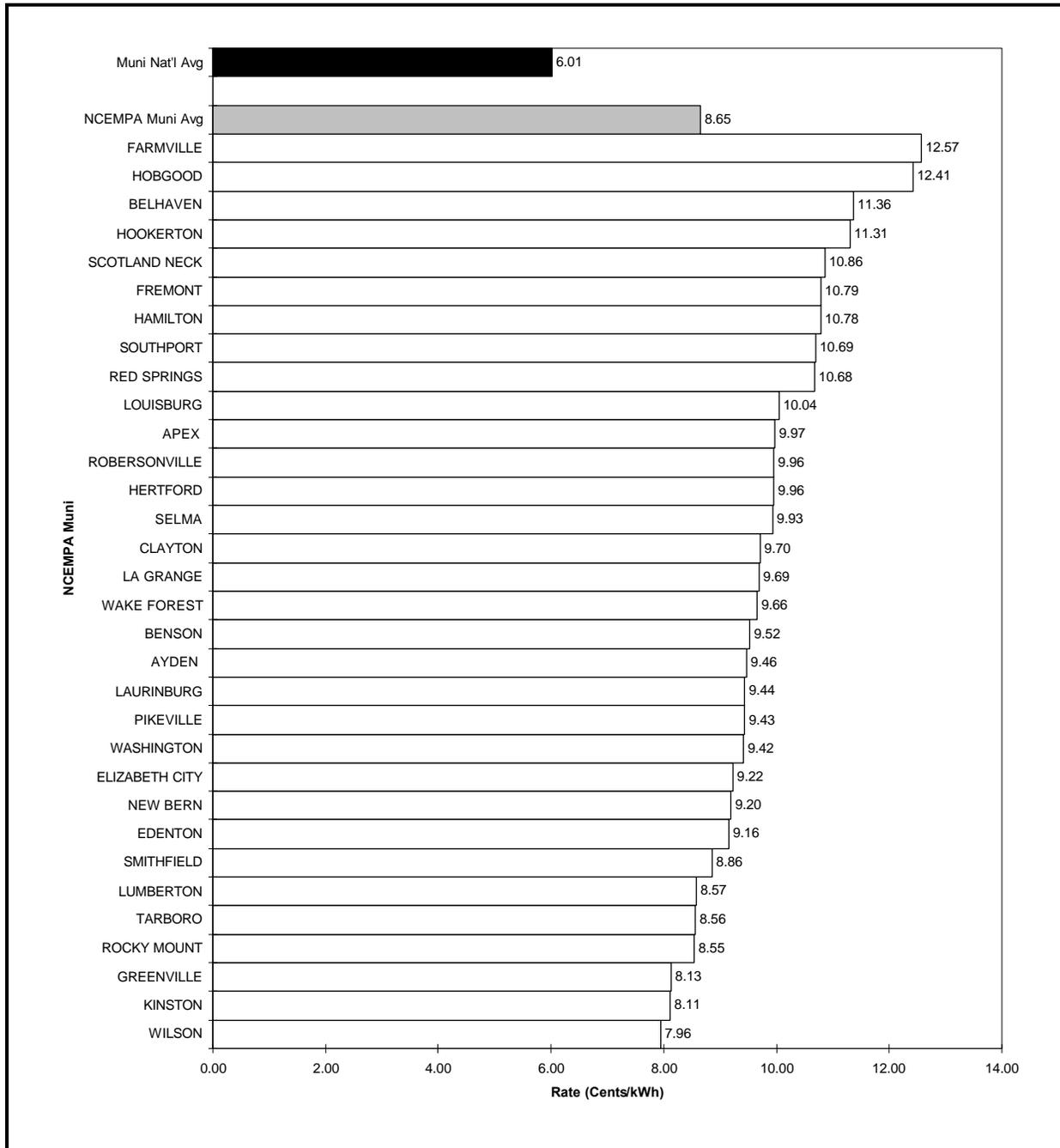
** Served by a North Carolina Electric Membership Corporation Member.

Figure D-1-ii. Average Rate for All Customer Classes: NCMPA1 Members



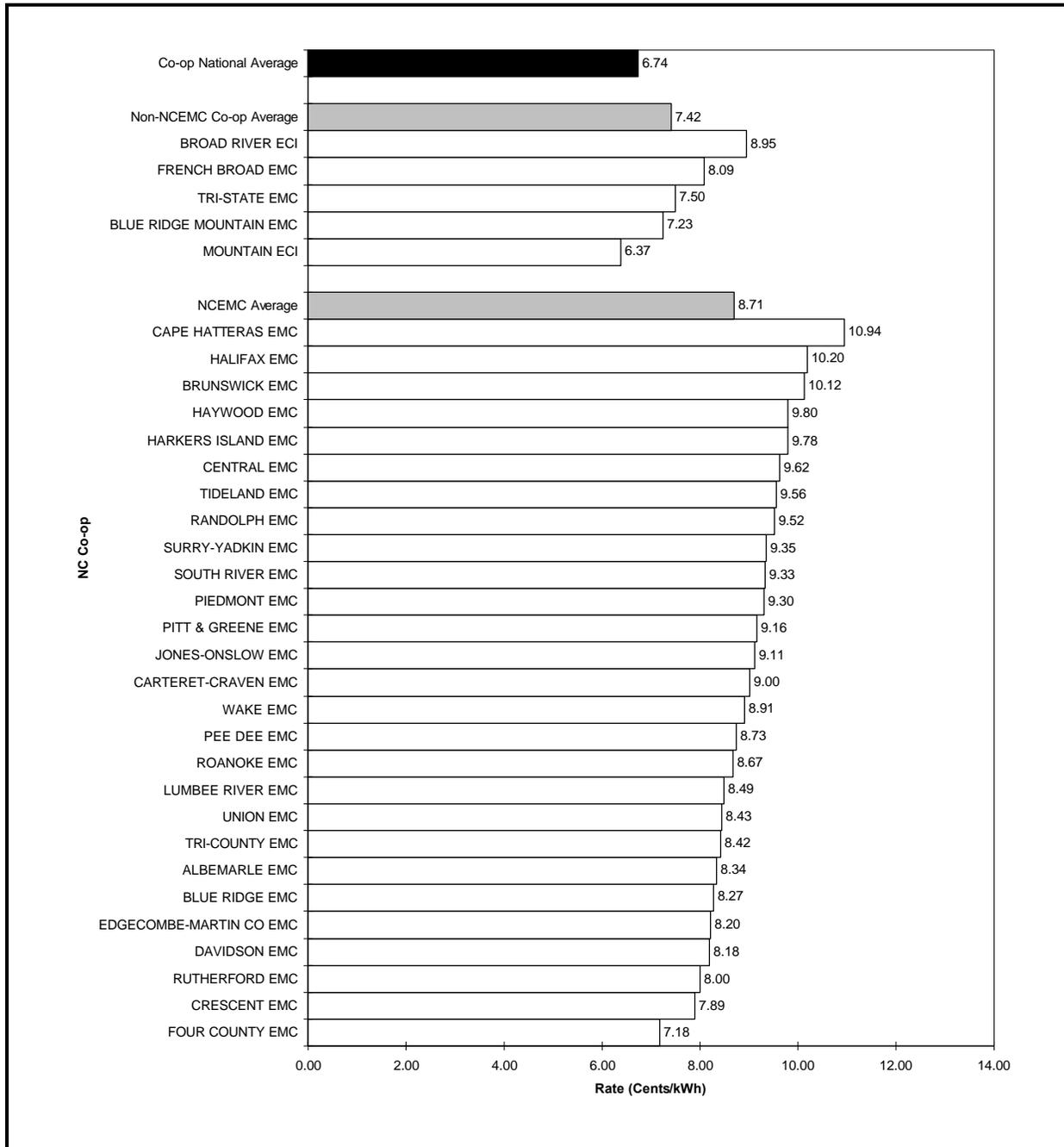
This figure corresponds to Figure 3-8.

Figure D-1-iii. Average Rate for All Customer Classes: NCEMPA Members



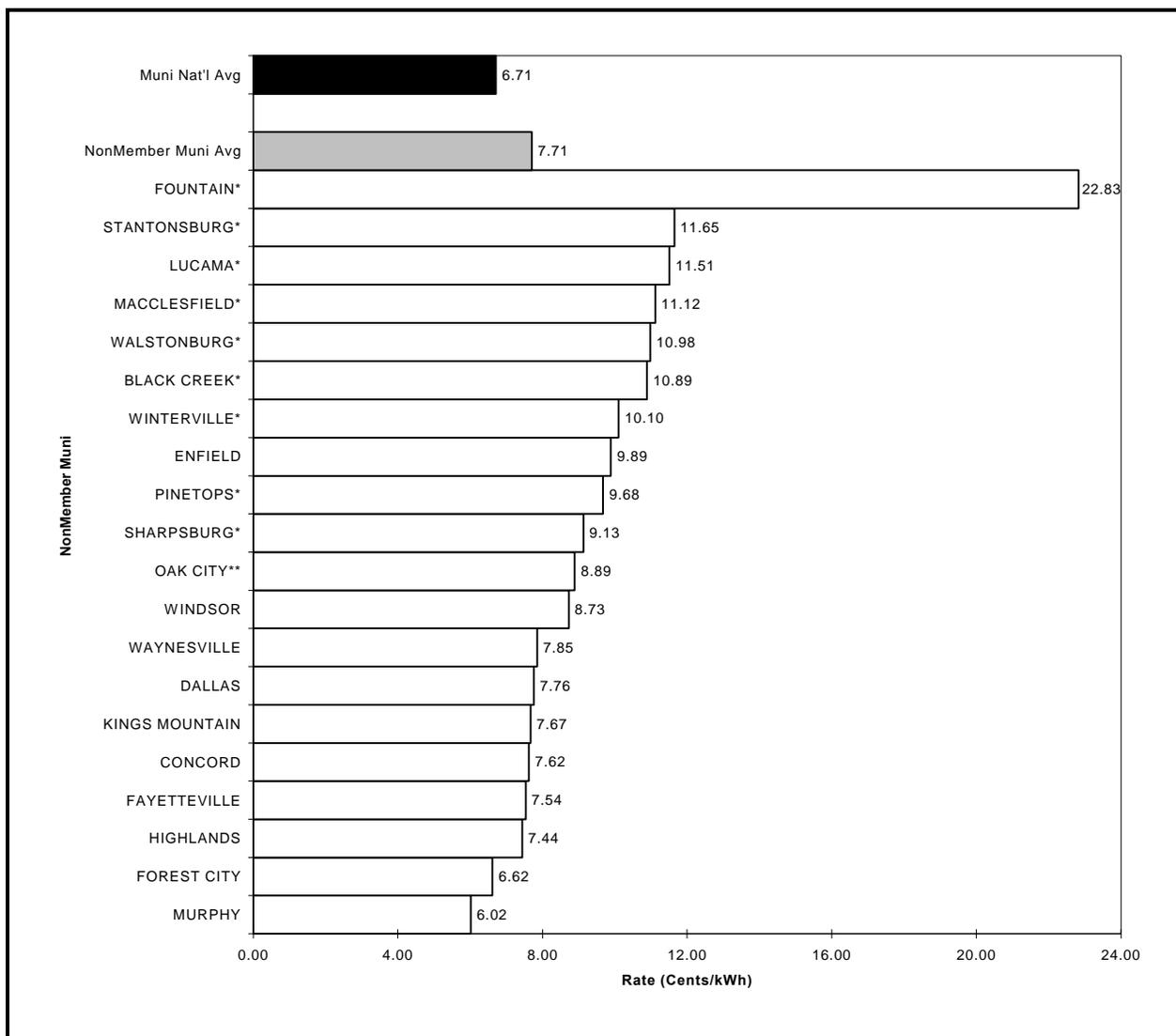
This figure corresponds to Figure 3-8.

Figure D-1-iv. Average Rate for All Customer Classes: Co-ops



This figure corresponds to Figure 3-8.

Figure D-2-i. Average Rate for Residential Customers: Municipal Power Agency Nonmembers

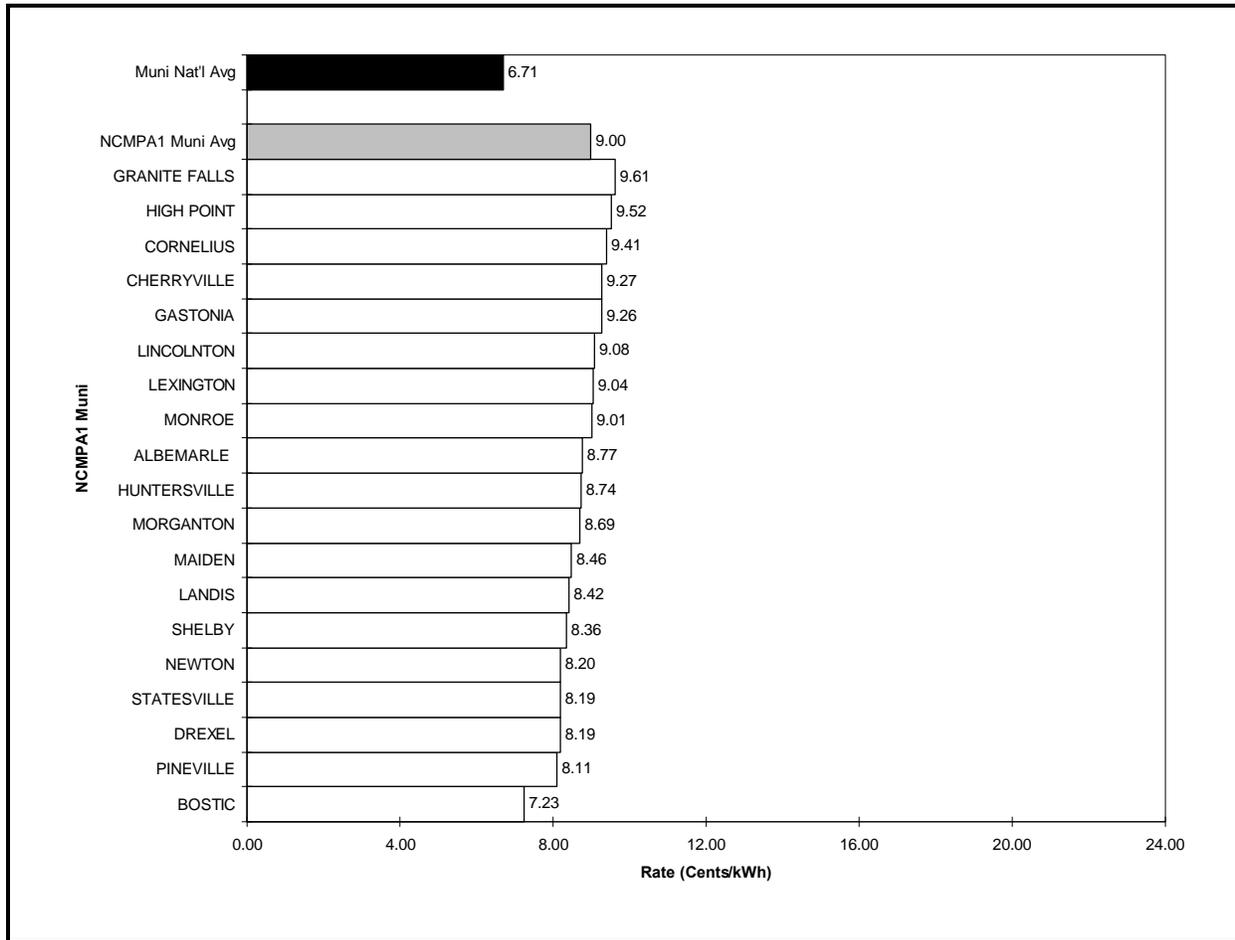


This figure corresponds to Figure 3-9.

* Served by a municipal power agency member.

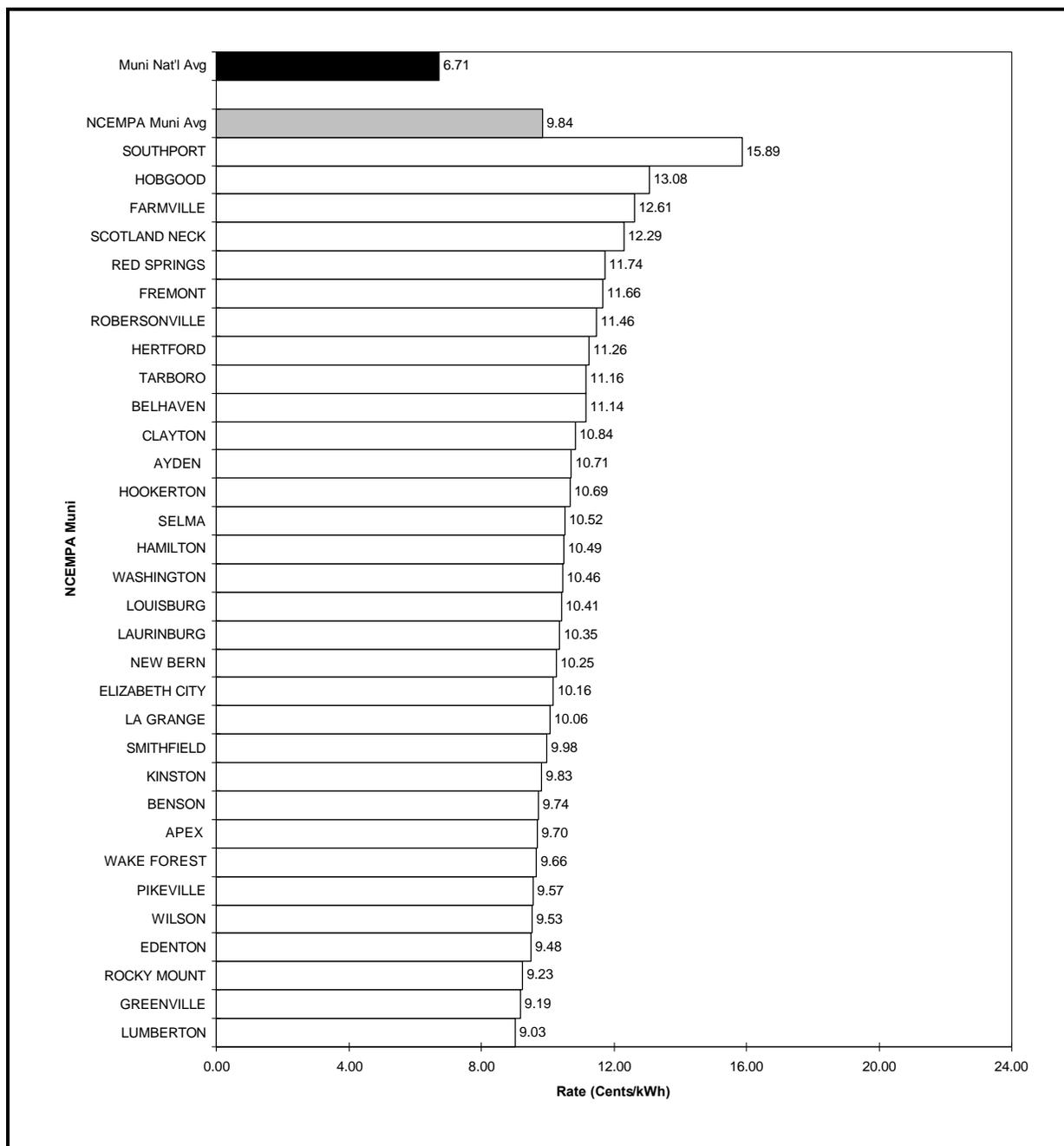
**Served by a North Carolina Electric Membership Corporation member.

Figure D-2-ii. Average Rate for Residential Customers: NCMPA1 Members



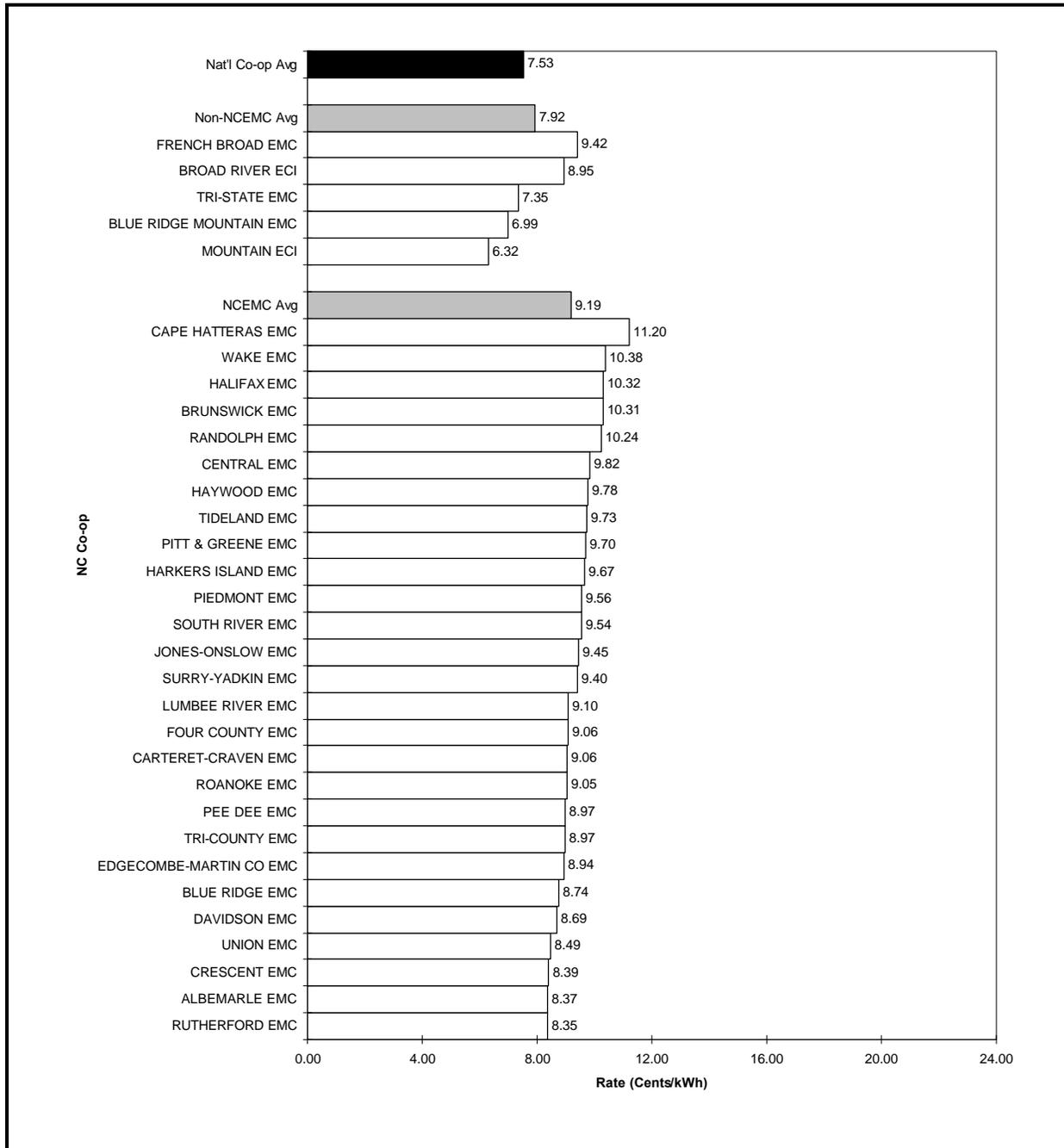
This figure corresponds to Figure 3-9.

Figure D-2-iii. Average Rate for Residential Customers: NCEMPA Members



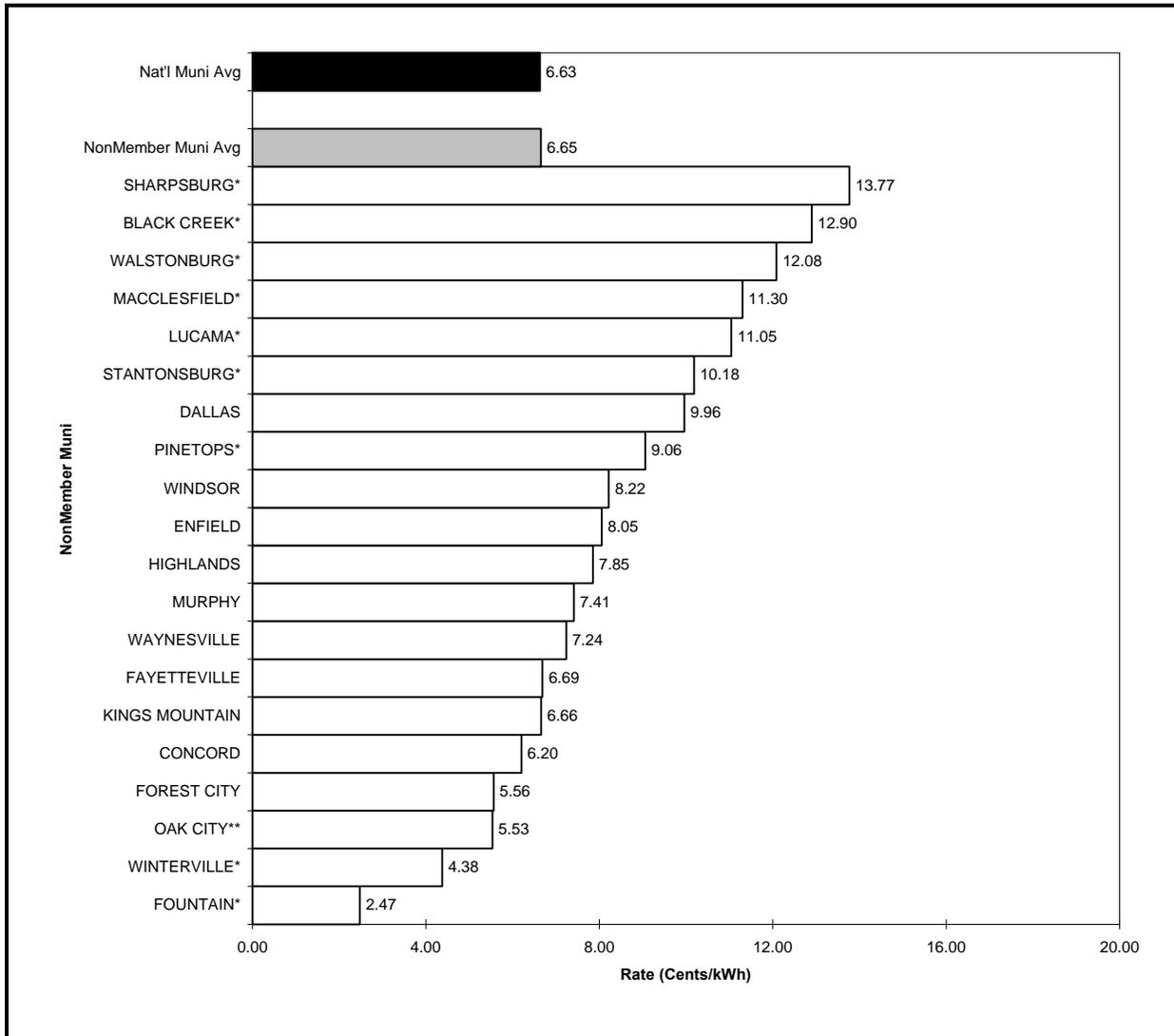
This figure corresponds to Figure 3-9.

Figure D-2-iv. Average Rate for Residential Customers: Co-ops



This figure corresponds to Figure 3-9.

Figure D-3-i. Average Rate for Commercial Customers: Municipal Power Agency Nonmembers

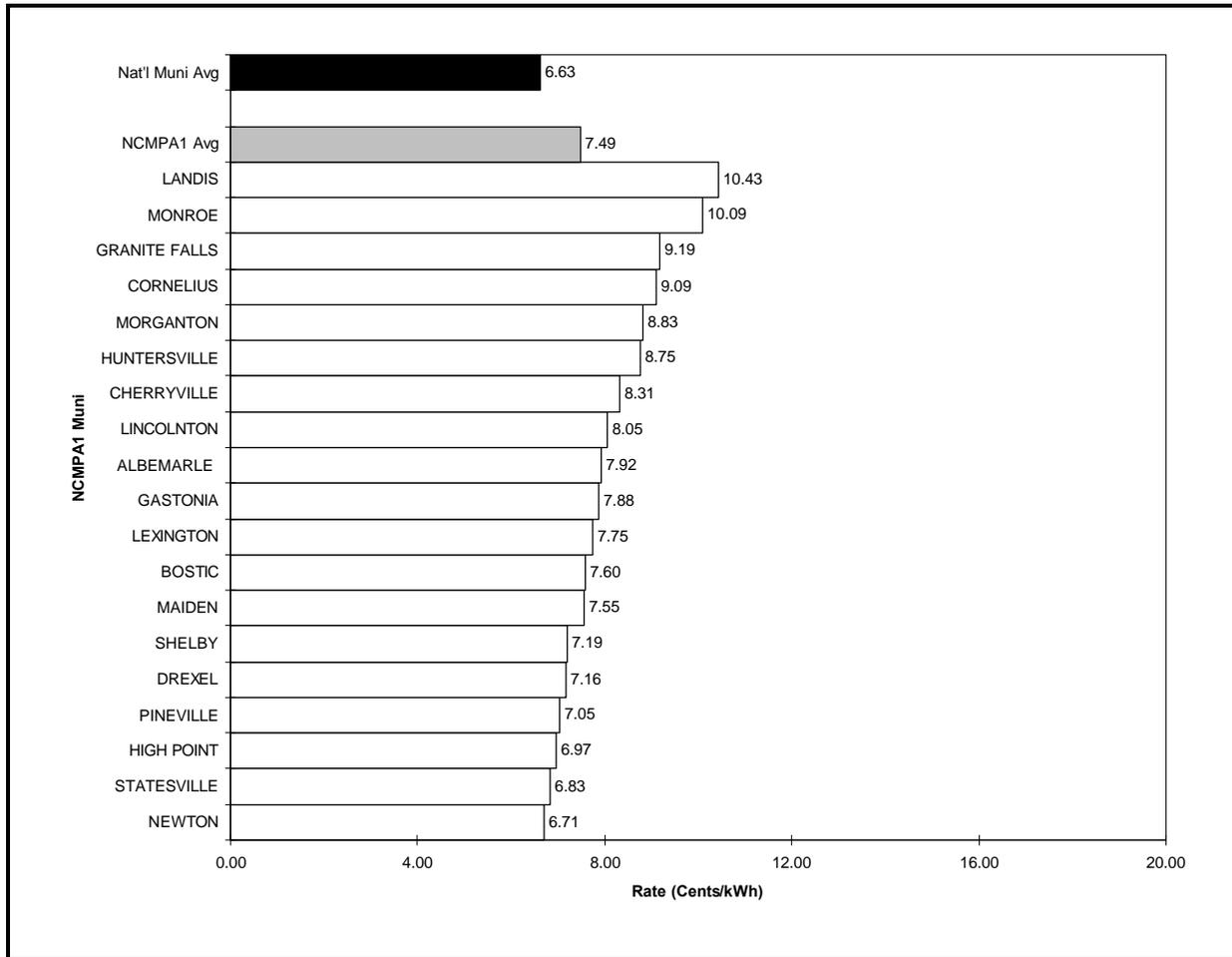


This figure corresponds to Figure 3-10.

*Served by a municipal power agency member.

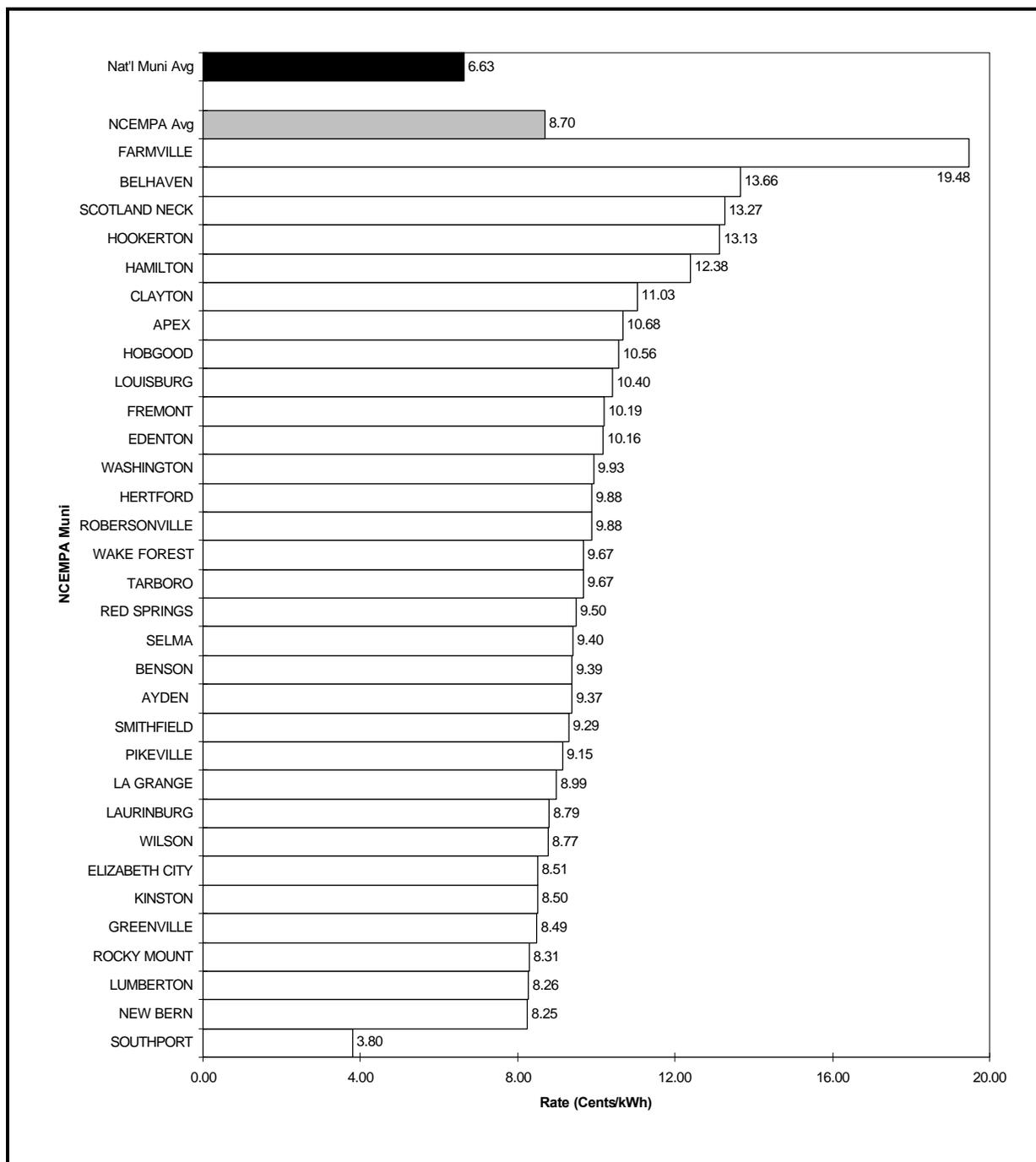
**Served by a North Carolina Electric Membership Corporation member.

Figure D-3-ii. Average Rate for Commercial Customers: NCMPA1 Members



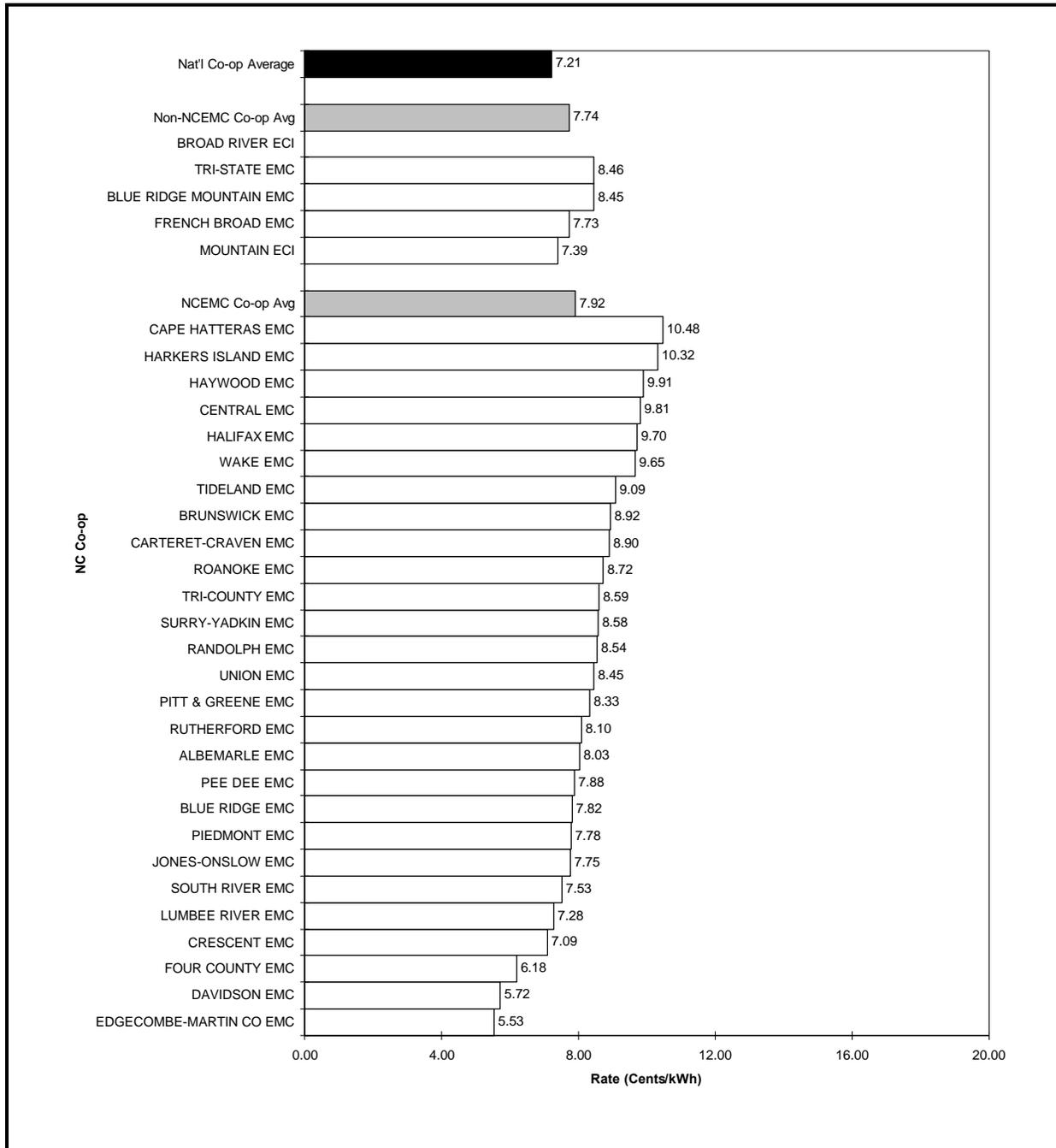
This figure corresponds to Figure 3-10.

Figure D-3-iii. Average Rate for Commercial Customers: NCEMPA Members



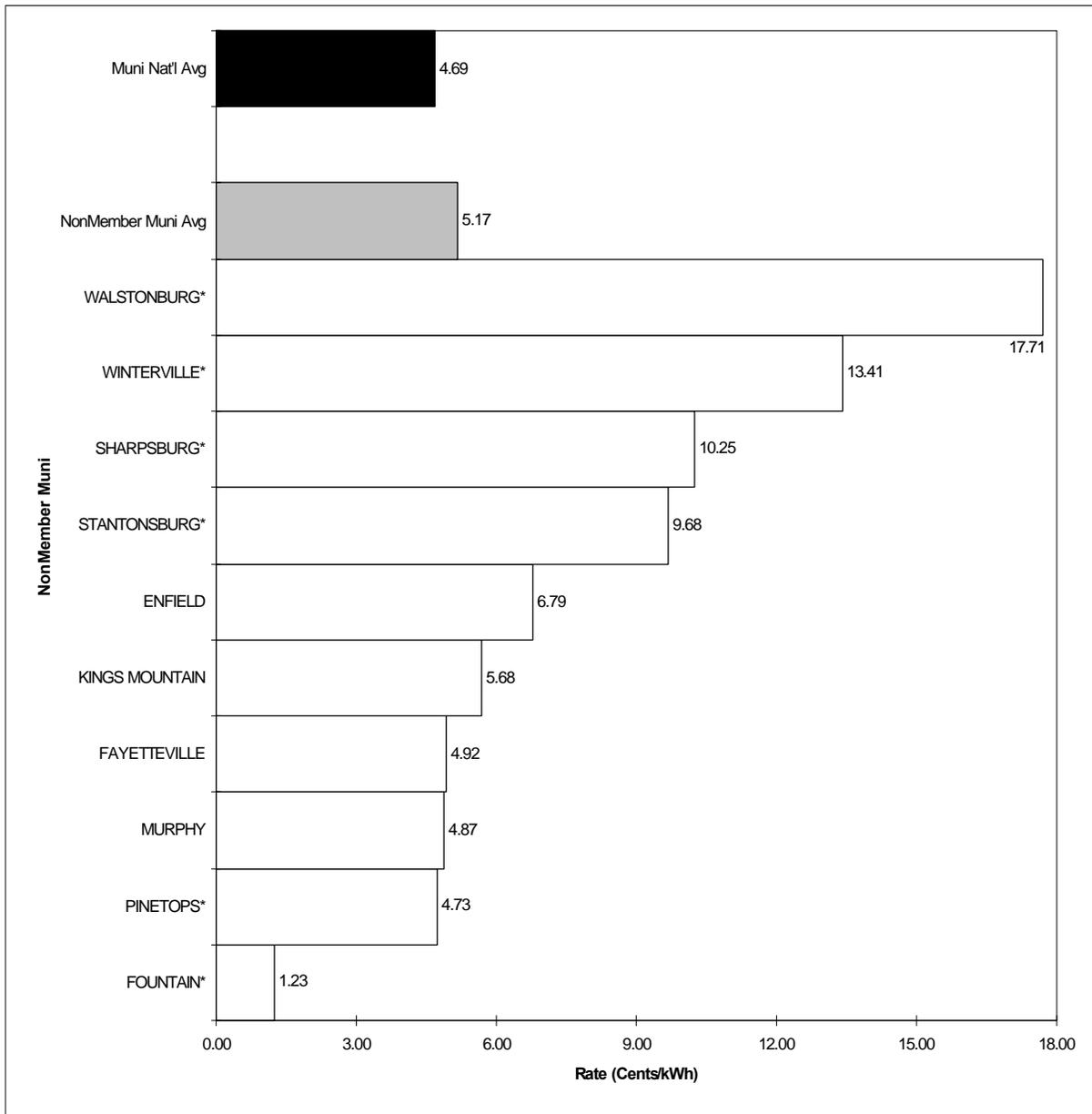
This figure corresponds to Figure 3-10.

Figure D-3-iv. Average Rate for Commercial Customers: Co-ops



This figure corresponds to Figure 3-10.

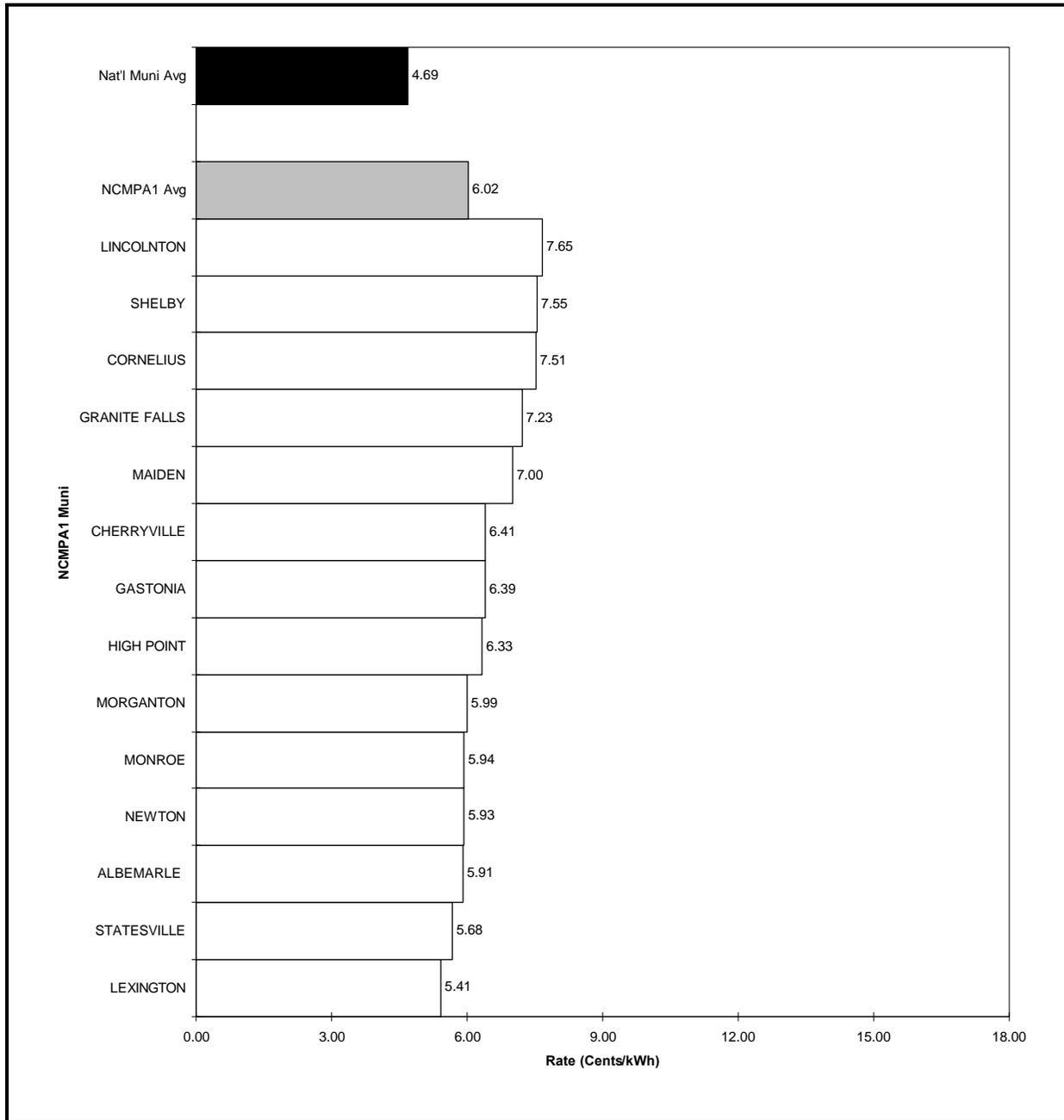
Figure D-4-i. Average Rate for Industrial Customers: Municipal Power Agency Nonmembers



This figure corresponds to Figure 3-11.

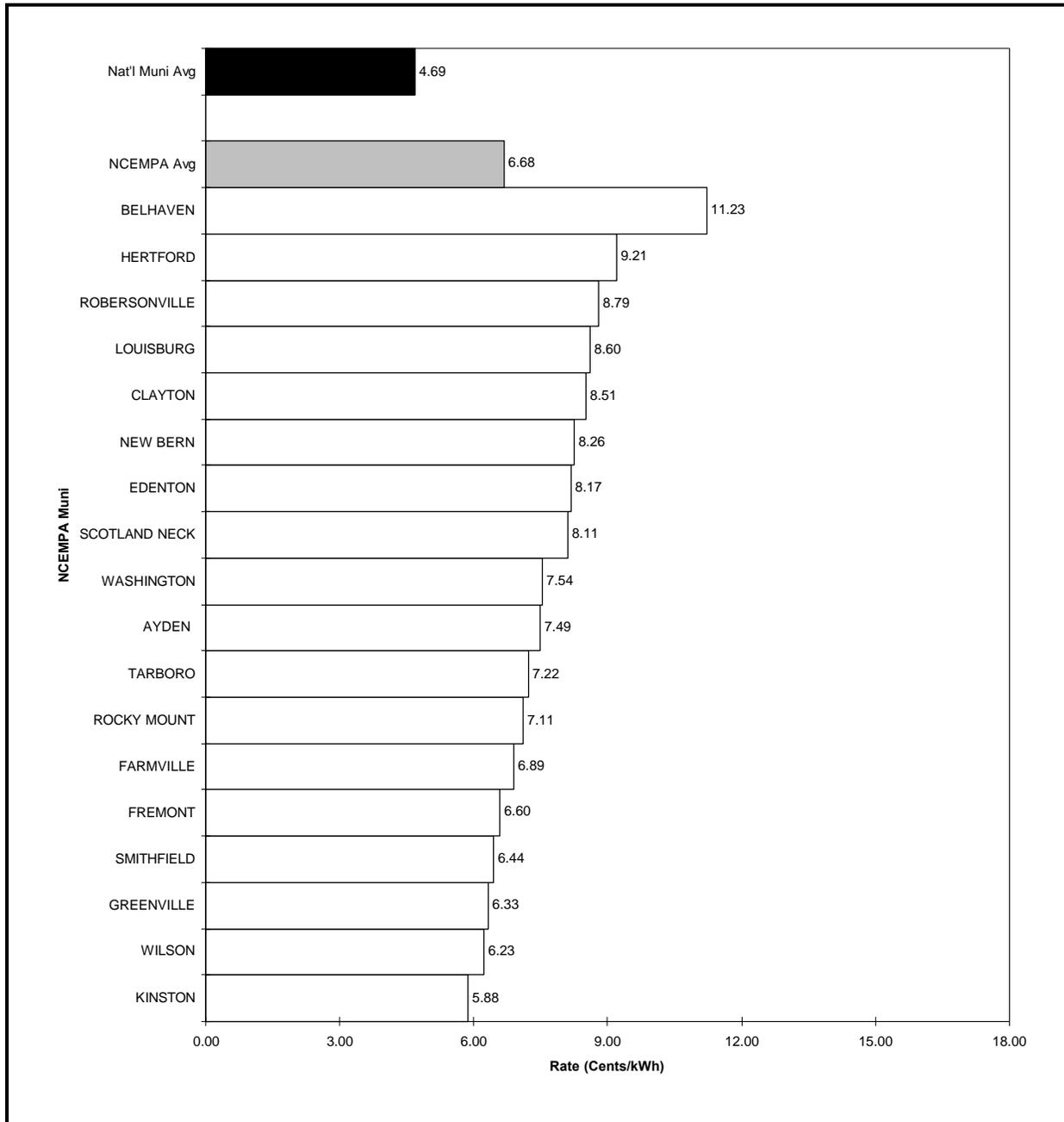
*Served by a municipal power agency member.

Figure D-4-ii. Average Rate for Industrial Customers: NCMPA1 Members



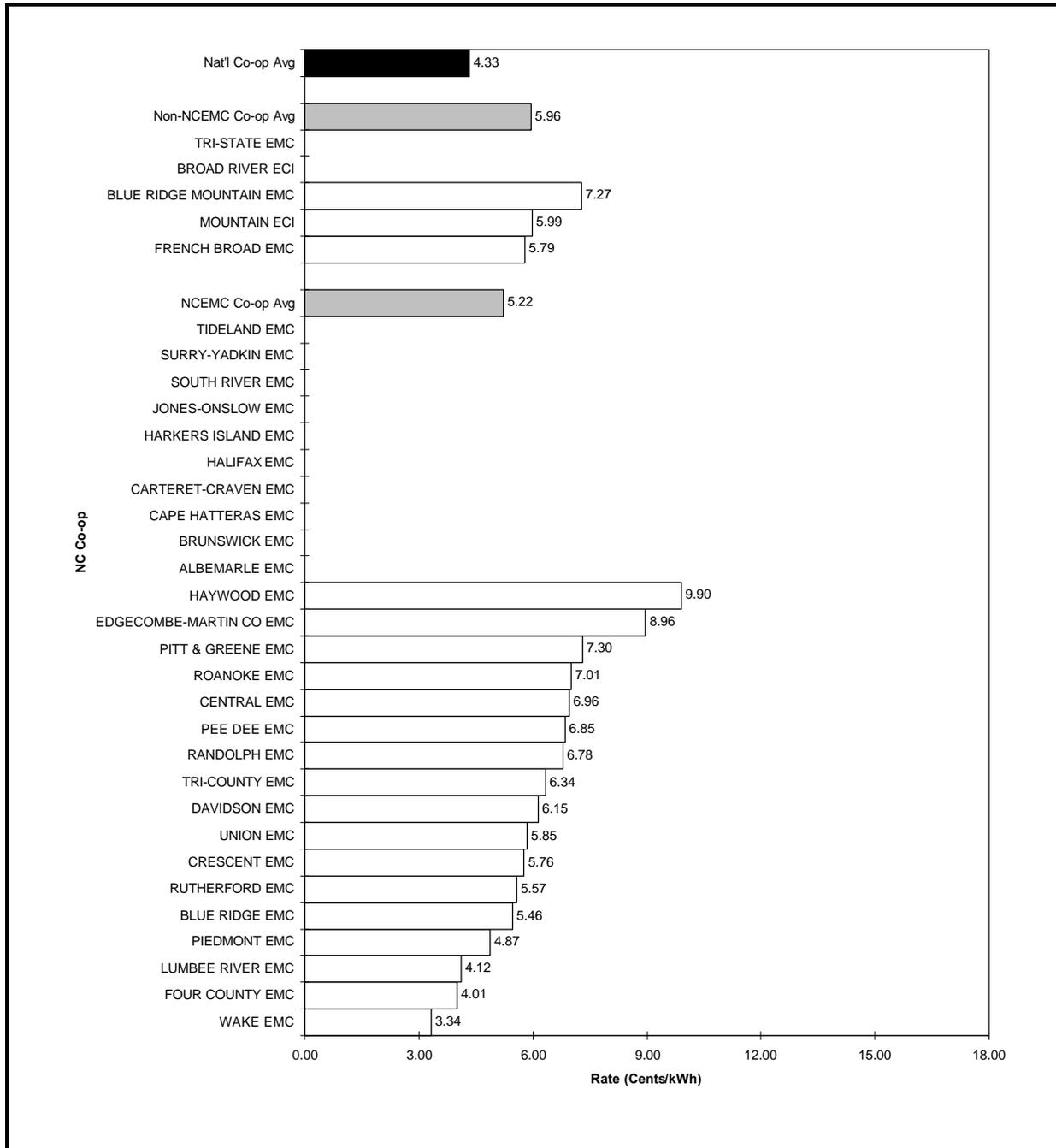
This figure corresponds to Figure 3-11.

Figure D-4-iii. Average Rate for Industrial Customers: NCEMPA Members



This figure corresponds to Figure 3-11.

Figure D-4-iv. Average Rate for Industrial Customers: Co-ops



This figure corresponds to Figure 3-11.

E **Average Electric Rates for Munis by Usage**

The charts in this appendix provide average retail rates for individual munis by usage level. Data were collected by RTI from the members of the NCMPA1 and NCEMPA municipal power agencies in June 1998.

Table E-1. Average Annual Rates by Usage: Residential Customers

	Monthly Usage (kWh)			
	300	500	1,000	2,000
NCEMPA Average	12.38	11.28	10.41	9.99
Town of Apex	12.94	11.76	10.75	10.04
Town of Ayden	12.13	11.05	10.24	9.83
Town of Belhaven	13.83	12.73	11.90	11.49
Town of Benson	12.27	11.08	9.68	8.98
Town of Clayton	12.43	11.53	10.85	10.51
Town of Edenton	11.43	10.47	9.75	9.24
City of Elizabeth City	11.83	10.89	10.19	9.84
Town of Farmville	12.25	11.09	10.22	9.78
Town of Fremont	13.18	11.57	10.36	9.76
Greenville Utilities Commission	11.36	10.28	9.47	9.07
Town of Hamilton	13.88	12.60	11.64	11.16
Town of Hertford	13.63	12.22	11.17	10.65
Town of Hobgood	14.24	13.20	12.43	12.04
Town of Hookerton	13.50	12.07	10.83	12.57
City of Kinston	11.89	10.74	9.87	9.43
Town of LaGrange	13.05	11.76	10.53	9.54
City of Laurinburg	12.46	11.33	10.48	9.97
Town of Louisburg	12.38	11.40	10.51	9.83
City of Lumberton	10.62	9.67	8.95	8.59
City of New Bern	11.12	10.77	10.50	10.37
Town of Pikeville	11.50	10.44	9.64	9.24
Town of Red Springs	12.79	11.76	10.99	10.61
Town of Robersonville	13.25	12.20	11.42	10.62
City of Rocky Mount	10.98	10.00	9.27	8.91
Town of Scotland Neck	14.08	12.62	11.53	10.99
Town of Selma	11.90	10.97	10.28	9.93
Town of Smithfield	11.97	10.94	10.17	9.79
City of Southport	10.18	9.25	8.54	8.19
Town of Tarboro	12.22	11.19	10.42	10.04
Town of Wake Forest	12.79	11.48	10.49	9.99
City of Washington	12.72	11.55	10.50	9.71
City of Wilson	11.23	10.21	9.44	9.06
NCMPA1 Average	10.76	9.62	8.86	8.36
City of Albemarle	11.16	9.89	9.22	8.88
Town of Bostic	8.28	7.48	6.94	6.59
City of Cherryville	11.25	10.12	9.22	8.59
Town of Cornelius	11.88	10.68	9.78	9.33
Town of Drexel	10.58	9.15	8.53	8.22
City of Gastonia	11.01	9.81	8.91	8.46
Town of Granite Falls	11.99	10.50	9.34	8.68
City of High Point	10.56	9.23	8.18	7.66
Town of Huntersville	11.88	10.68	9.78	9.33
Town of Landis	11.22	10.48	9.89	9.29
City of Lexington	12.69	11.05	9.67	8.84
City of Lincolnton	10.52	9.50	8.80	8.58
Town of Maiden	11.87	10.36	9.51	8.76
City of Monroe	10.76	9.78	9.05	8.46
City of Morganton	9.64	8.57	8.38	8.28
City of Newton	9.60	8.77	8.25	7.73
Town of Pineville	9.65	8.68	8.51	8.16
City of Shelby	10.90	9.70	8.63	7.98
City of Statesville	8.94	8.30	7.84	7.05

Note: Average rate is derived by dividing average monthly bill by usage.

Source: Electricities of North Carolina 6/98 data submittal to RTI.

Table E-2. Average Annual Rates by Usage: Small Nonresidential Customers

	Monthly Usage (kWh) (kW Demand)				
	360 (5)	720 (10)	1,800 (25)	18,000 (50)	36,000 (100)
NCEMPA Average	15.46	13.81	13.22	9.11	9.16
Town of Apex	13.71	11.73	10.54		
Town of Ayden	13.74	12.24	11.24		
Town of Belhaven	19.66	18.44	13.95		
Town of Benson	16.00	14.50	11.84		
Town of Clayton	15.98	18.42	17.41		
Town of Edenton	13.45	11.10	9.66	7.65	7.49
City of Elizabeth City	13.77	11.53	10.19	7.31	8.15
Town of Farmville	11.26	9.46			
Town of Fremont	23.84	21.75	16.53	8.96	
Greenville Utilities Commission	12.98	11.37	10.15		
Town of Hamilton	15.64	13.60	12.37	11.64	11.59
Town of Hertford	15.59	12.44	12.93	8.70	8.48
Town of Hobgood	14.21	12.93	17.83	11.05	11.08
Town of Hookerton	26.28	23.25	19.74	10.46	10.33
City of Kinston	14.69	16.58	15.38	7.32	7.23
Town of LaGrange	11.41	9.61			
City of Laurinburg	14.78	12.69	11.44		
Town of Louisburg	16.34	16.12	15.12	9.26	9.16
City of Lumberton	19.68	17.55	16.27		
City of New Bern	14.02	12.21	11.13		
Town of Pikeville	11.60	10.22	9.39	8.89	8.86
Town of Red Springs	23.54	20.88	19.27	9.52	9.38
Town of Robersonville	13.33	11.75	10.85	8.45	8.24
City of Rocky Mount	14.37	12.44	10.11		
Town of Scotland Neck	17.85	14.10	22.63	11.05	11.05
Town of Selma	14.13	12.42	10.48		
Town of Smithfield	14.20	12.50			
City of Southport	9.53	9.04	8.75	8.57	8.56
Town of Tarboro	14.63	12.42	14.22	8.63	8.59
Town of Wake Forest	15.48	13.85	11.48		
City of Washington	14.46	12.31	11.02	8.36	
City of Wilson	14.58	12.67	11.52		
NCMPA1 Average	14.70	12.61	11.36	7.41	5.99
City of Albemarle	14.76	12.96	11.87		
Town of Bostic	10.98	9.82	9.12	5.32	5.12
City of Cherryville	14.96	13.00	11.82	7.73	
Town of Cornelius	15.47	13.74	12.69	8.39	
Town of Drexel	13.25	11.38	10.25	6.92	
City of Gastonia	15.32	13.23	11.98	8.01	
Town of Granite Falls	15.99	13.67	12.27	8.12	
City of High Point	13.98	12.32	11.33	7.45	6.98
Town of Huntersville	15.47	13.74	12.69	8.39	
Town of Landis	12.66	11.72	11.16	8.37	8.23
City of Lexington	23.10	17.40	13.98	8.57	
City of Lincolnnton	15.74	13.15	11.60	7.17	7.14
Town of Maiden	15.71	13.14	11.60	7.32	
City of Monroe		(SGS rate schedule is not based on similar usage/demand)			
City of Morganton	13.32	11.07	9.71	7.46	7.28
City of Newton	12.69	11.18	10.28	6.40	6.32
Town of Pineville	13.82	12.15	11.15	7.48	
City of Shelby	14.51	12.26	10.90	6.77	6.85
City of Statesville	12.94	11.11	10.01	6.15	5.95

Note: Average rate is derived by dividing average monthly bill by usage.

Source: ElectriCities of North Carolina 6/98 data submittal to RTI.

Table E-3. Average Annual Rates by Usage: Medium/Large Nonresidential Customers

	Monthly Usage (kWh) (kW Demand)				
	360 (5)	720 (10)	1,800 (25)	18,000 (50)	36,000 (100)
NCEMPA Average	14.27	11.69	13.77	8.46	8.42
Town of Apex				9.38	9.34
Town of Ayden				8.67	8.63
Town of Belhaven				10.74	10.71
Town of Benson				8.59	8.65
Town of Clayton				8.48	8.43
Town of Edenton	13.45	11.10	9.66	7.65	7.49
City of Elizabeth City	13.77	11.53	10.19	7.31	8.15
Town of Farmville			16.31	8.55	8.51
Town of Fremont					7.59
Greenville Utilities Commission				8.52	7.88
Town of Hamilton					
Town of Hertford	15.59	12.44	12.93	8.70	8.48
Town of Hobgood					
Town of Hookerton					
City of Kinston					
Town of LaGrange			18.20	8.65	8.63
City of Laurinburg				8.08	8.02
Town of Louisburg					9.47
City of Lumberton				7.61	7.57
City of New Bern				8.64	8.60
Town of Pikeville					
Town of Red Springs					
Town of Robersonville					
City of Rocky Mount				7.69	7.65
Town of Scotland Neck					
Town of Selma				8.49	8.45
Town of Smithfield			15.36	7.60	7.36
City of Southport					
Town of Tarboro					
Town of Wake Forest				9.62	9.08
City of Washington					8.72
City of Wilson				7.83	7.79
NCMPA1 Average	18.76	15.29	13.21	6.92	7.01
City of Albemarle				7.58	7.28
Town of Bostic	18.76	15.29	13.21	5.71	5.64
City of Cherryville				7.09	7.51
Town of Cornelius				7.59	7.52
Town of Drexel				6.33	6.26
City of Gastonia					7.28
Town of Granite Falls				7.18	7.59
City of High Point					
Town of Huntersville				7.59	7.52
Town of Landis				7.05	6.98
City of Lexington				7.86	7.72
City of Lincolnton					
Town of Maiden				6.63	7.24
City of Monroe					
City of Morganton					
City of Newton					
Town of Pineville					6.97
City of Shelby				6.60	6.53
City of Statesville				5.79	6.13

Note: Average rate is derived by dividing average monthly bill by usage.

Source: Electricities of North Carolina 6/98 data submittal to RTI.

Table E-4. Average Annual Rates by Usage: Large Nonresidential Customers

	Monthly Usage (kWh)					
	(kW Demand)					
	450,000 (1,250)	540,000 (1,500)	1,800,000 (5,000)	3,600,000 (10,000)	9,000,000 (25,000)	18,000,000 (50,000)
NCEMPA Average	7.49	7.94	7.99	6.69		
Town of Apex						
Town of Ayden						
Town of Belhaven						
Town of Benson						
Town of Clayton						
Town of Edenton	5.15					
City of Elizabeth City						
Town of Farmville	7.83	7.82				
Town of Fremont						
Greenville Utilities Commission						
Town of Hamilton						
Town of Hertford						
Town of Hobgood						
Town of Hookerton						
City of Kinston	7.86	7.84	7.76			
Town of LaGrange						
City of Laurinburg						
Town of Louisburg						
City of Lumberton	7.90	7.87				
City of New Bern						
Town of Pikeville						
Town of Red Springs						
Town of Robersonville						
City of Rocky Mount						
Town of Scotland Neck						
Town of Selma						
Town of Smithfield						
City of Southport						
Town of Tarboro						
Town of Wake Forest						
City of Washington	7.87	7.87				
City of Wilson	8.31	8.29	8.22	6.69		
NCMPA1 Average	6.38	6.37	6.35	6.35		
City of Albemarle	6.42	6.38				
Town of Bostic						
City of Cherryville	6.62	6.62				
Town of Cornelius						
Town of Drexel						
City of Gastonia	6.60	6.60				
Town of Granite Falls	6.75	6.76				
City of High Point	6.18	6.11				
Town of Huntersville						
Town of Landis						
City of Lexington	6.12	6.10				
City of Lincolnton	6.48					
Town of Maiden	6.67	6.68				
City of Monroe	6.63	6.62	6.40	6.35		
City of Morgantown	6.09	6.07				
City of Newton						
Town of Pineville	6.55	6.55	6.30			
City of Shelby	6.18					
City of Statesville	5.62	5.62				

Note: Average rate is derived by dividing average monthly bill by usage.

Source: Electricities of North Carolina 6/98 data submittal to RTI.

F

List of Most Electricity-Intensive Industries in North Carolina

Table F-1. Employment Change in Top Electricity-Intensive Industries (1990-1995)

SIC Code	Industry	Electricity Expenditure as Percentage of Input Costs	Percentage Change in U.S. (1990-1995)	Percentage Change in North Carolina (1990-1995)
333	Primary nonferrous metals	10.40%	-8.41%	-51.73%
233	Women's and misses' outerwear	1.84%	-10.44%	-23.50%
224	Narrow fabric mills	3.04%	-2.09%	-20.26%
287	Agricultural chemicals	2.58%	-2.58%	-19.77%
322	Glass and glassware, pressed or blown	5.97%	-16.03%	-17.49%
226	Textile finishing, except wool	2.70%	1.58%	-17.41%
228	Yarn and thread mills	3.87%	-15.54%	-16.90%
262	Paper mills	4.86%	-7.96%	-14.77%
221	Broadwoven fabric mills, cotton	3.70%	-20.12%	-14.29%
295	Asphalt paving and roofing materials	1.81%	-1.60%	-14.26%
329	Miscellaneous nonmetallic mineral	4.08%	-8.57%	-9.49%
225	Knitting mills	1.75%	-3.68%	-8.63%
282	Plastics materials and synthetics	2.57%	-7.88%	-7.06%
341	Metal cans and shipping containers	1.50%	-17.20%	-6.66%
249	Miscellaneous wood products	2.91%	-1.13%	-2.38%
301	Tires and inner tubes	2.04%	-4.41%	-1.87%

(continued)

Table F-1. Employment Change in Top Electricity-Intensive Industries (1990-1995) (continued)

SIC Code	Industry	Electricity Expenditure as Percentage of Input Costs	Percentage Change in U.S. (1990-1995)	Percentage Change in North Carolina (1990-1995)
214	Tobacco stemming and redrying	0.81%	-30.30%	0.00%
324	Cement, hydraulic	15.37%	-16.33%	0.00%
321	Flat glass	5.26%	-11.35%	0.00%
261	Pulp mills	2.80%	-2.05%	0.00%
334	Secondary nonferrous metals	0.97%	-1.91%	0.00%
263	Paperboard mills	4.64%	1.10%	0.00%
223	Broadwoven fabric mills, wool	2.27%	17.03%	0.00%
222	Broadwoven fabric mills, manmade fiber and silk	3.96%	1.76%	2.86%
286	Industrial organic chemicals	2.04%	-4.61%	3.22%
325	Structural clay products	4.05%	-12.10%	5.41%
332	Iron and steel foundries	4.88%	-1.58%	7.03%
242	Sawmills and planing mills	1.99%	0.41%	10.74%
331	Blast furnace and basic steel products	3.76%	-11.67%	11.32%
281	Industrial inorganic chemicals	14.50%	-18.70%	11.65%
326	Pottery and related products	2.83%	7.30%	15.63%
335	Nonferrous rolling and drawing	1.61%	-2.06%	20.09%
347	Metal services, n.e.c.	2.93%	4.61%	23.86%
207	Fats and oils	0.99%	-7.06%	25.99%
308	Miscellaneous plastics products, n.e.c.	2.69%	18.17%	27.89%
229	Miscellaneous textile goods	2.67%	5.21%	28.63%
306	Fabricated rubber product, n.e.c.	2.23%	5.34%	29.99%
323	Products of purchased glass	2.34%	9.88%	32.17%
336	Nonferrous foundries (castings)	2.58%	7.35%	34.50%
339	Miscellaneous primary metal products	3.56%	-13.03%	72.04%
Total			-1.31%	-4.05%

Source: U.S. Department of Commerce, Bureau of the Census. *Country Business Patterns* (various years).